6/10/83 09640-2 A

THE MICHIGAN ECONOMY

Volume 2 No. 2
FEBRUARY 1983

Published by the
Bureau of Business Research
School of Business
Administration
The Prentis Building

Wayne State University

DETROIT, MICHIGAN 48202

Published monthly, except July and August, when bimonthly. Third class postage paid at Detroit, Michigan.

ISSN: 0730-272X

The Automotive Economy

by DAVID I. VERWAY, *Director, Bureau of Business Research, School of Business Administration, Wayne State University*

In January of this year Buick Motor Division of the General Motors Corporation announced "Buick City," a renovation that will replace one Fisher Body plant and two Buick assembly lines, together capable of producing one hundred vehicles per hour, with one rated at seventy-five per hour. Buick will emphasize to suppliers who are not already there the importance of having nearby plants to take advantage of "just-in-time" production of passenger cars.

Just-in-time, or kanban, the Japanese term for the same phenomenon, is a system of careful coordination and close monitoring so as to minimize the accumulation of materials and components between machines, stations, or factories in the production process. A leaner work-in-process inventory reduces the amount of a loan required to finance it. Such loans, a part of so-called working capital, have become major costs in these days of high interest rates. This is especially true in the automotive industry where manufacturers are accustomed to hedging against supply disruptions by stockpiling several days' or even weeks' parts inventory. These large "floats" reflect a make-do mentality rather than "let's get it right," an attitude that evolved out of the need to meet ever expanding demand in the face of slowly rising capacity during the 1960s and early 1970s. In this helter-skelter of matching demand with supply, producers also relaxed their quality control on suppliers. Besides reducing carrying costs, the switch from "just-in-case" to just-in-time will give rise to earlier detection of flaws and better quality control inasmuch as defective parts will not accumulate.

The Flint, Michigan, plant, which now makes rear-drive Buicks in the traditional body-chassis configuration, will make front-drive, unitized-body GM passenger cars beginning fall 1984 (1985 model year). In Lansing, Michigan, Oldsmobile will convert its two assembly lines to the production of front-drive N cars for the 1985 model year. The two lines, each rated at fifty cars per hour, will make Oldsmobiles, Buicks, and Chevrolets. N cars will be sourced exclusively from Lansing. At Lake Orion this fall, the larger, front-drive Cadillacs and the Oldsmobile 98 will roll out of a new factory at a rate of seventy per hour. A now idle assembly line in Pontiac will produce the new Pontiac Fiero. By fall 1985 GM's new Detroit-Hamtramck factory will be making downsized Cadillac Eldorados and Sevilles, Oldsmobile Toronados, and Buick Rivieras, now sourced at Linden, New Jersey. Meanwhile, the Clark Avenue (Detroit) Cadillac plant will continue to produce rear-drive Cadillacs and will start to make rear-drive Oldsmobile 88s as well. The only GM car assembly plant in Michigan not scheduled for major change at this time is the one at Willow Run, near Ypsilanti, where the GM Assembly Division makes Buick Skylarks and Olds Omegas.

Under current planning, during the 1986 model year 34 percent of GM's rated U.S. capacity to produce passenger cars will be located in Michigan. Whether Michigan plants actually produce 34 percent of GM cars will depend on market conditions for the various makes and models produced here and elsewhere.

BEST AVAILABLE COPY

Ford has announced no recent change in its automobile production capacity, other than the closure of its plant in San Jose, California. Michigan with car assembly plants in Dearborn, Wayne, and Wixom will have 33 percent of Ford's production capacity during the 1986 model year.

Chrysler Corporation, with assembly plants in Detroit; Newark, Delaware; Belvidere, Illinois; and Fenton, Missouri, has a capacity shortage. Its immediate plans include purchase of an idle plant in Sterling Heights, Michigan, where it will produce the new H car. For the 1986 model year Michigan will contain 36 percent of the U.S. passenger car production capacity of the Chrysler Corporation.

As matters now stand, 32 percent of this nation's car assembly capacity will be located in Michigan by fall 1985. Details of Chrysler, Ford, and GM capacity, along with the AMC, VW, and Honda figures, are shown in Table 1. Excluded are tiny producers such as Avanti (South Bend) and Excalibur (Milwaukee). The table does list the Canadian assembly plants for the major passenger car producers, however, because they are integral parts of their North American operations. Michigan is a top exporter of manufactured products as a consequence of our access to the Canadian market for assembled vehicles as well as intermediate components.

MICHIGAN'S PRODUCTION PROGNOSIS

At best, the U.S. auto industry will be capable of comfortably producing about 11.5 million 1986 model automobiles, given the capacity that will be available under the assumptions in Table 1. Michigan could assemble about 3.7 million, or 32 percent of that total. Since in the best previous year (1973) the United States produced 9.7 million cars and Michigan produced 3.3 million, and given the condition of demand for North American vehicles in the foreseeable future, it seems unlikely that either the United States or Michigan 1986 potential will be realized. The year 1986, it is assumed here, is the *next* peak production year for the North American automobile industry.

The Bureau of Industrial Economics of the U.S. Department of Commerce, looking ahead in its *1983 U.S. Industrial Outlook*, envisages retail sales of domestic new cars of 7.9 million during 1987, an increase of less than 40 percent over the 5.7 million for 1982. The 1982 figures reflect net imports of about 600,000 units from Canadian plants of Canadian-U.S. companies. The Commerce forecast is consistent with U.S. production of about 7 million automobiles during 1986 and with overseas import sales of about 30 percent of the U.S. market.

If the Commerce prognosis is borne out, if U.S. carmakers can find markets for only two-thirds of their capacity, they are unlikely to maintain that productive ability. Capacity would be cut to, say, 9 million annual production in this country. Michigan would produce about 2.45 million automobiles or 35 percent of the 7 million U.S. total. Michigan's share would increase with capacity reduction because most of the cuts would occur in the more distant plants from the industrial heartland. As a matter of fact, except for Chrysler Corporation which had allowed its Hamtramck and Lynch Road plants to become decrepit, recent closures have taken place at the perifery in California and New Jersey. Plants not permanently closed but not currently in operation are located in Georgia and California. Plants that would seem to be logical candidates for closure in a permanent shrinkage are located in California, Massachusetts, New Jersey, Delaware, Texas, New York, Illinois, and Michigan. In short, in a worst-case scenario Michigan stands to gain an increasing share of a diminished industry. To economize, companies would tend to close their plants most distant from suppliers concentrated in the industrial heartland around the Great Lakes. Another reason is that the imports are most popular in the more distant markets. Assembly plants in California, for example, have had to search for ever more distant inland markets as the import share has increased. It is more economical to assemble cars in Michigan than to send components from the midwest to California for assembly into cars destined for markets in Colorado for example.

In assessing Michigan's automotive future it seems important to focus on the kinds of vehicles that will be produced here. In Detroit, Wixom, Sterling Heights, and Lake Orion Township we will have about two-thirds of the U.S. capacity to make luxury vehicles. After a decade of obsession with downsizing and with meeting various government constraints, Detroit again is abuzz with styling, performance, and engineering, particularly in the upper echelons of the market. This segment promises to be the fastest growing within the domestic product lineup since, by 1986, one in seven U.S. households will have annual incomes of $50,000 or more. That compares with one in fourteen in 1981, and one in sixty in 1976.

TRUCKS

Chrysler makes small trucks (Rampage and Scamp) in Belvidere, Illinois. Pick-ups, vans, and its sport-utility Ramcharger are made in Warren, Michigan, locale of about 80 percent of its U.S. truck-making capacity. Ford makes its larger Bronco as well as light duty trucks in Wayne, Michigan; about 14 percent of Ford truck capacity is located here. GM has about 46 percent of its truck capacity — ranging from its new, small S truck to heavy duty semitractors — in its Detroit, Flint, and Pontiac plants. International Harvester, Mack, and other producers have no Michigan plants. All told, in 1986 Michigan will have about a third of U.S. capacity to produce trucks. Assuming the worst, that in 1986 the U.S. industry will be producing trucks at the same level as it did in 1976, and assuming that only 30 percent of those vehicles are Michigan made, this state will produce about 900,000 units, 56 percent above the 1982 rate and well below the 1973 and 1978 levels.

All GM buses are produced in Pontiac. This state has no other bus plants. Because of the growth in number of producers in this country, it is difficult to calculate Michigan's future share.

In summary, Michigan's share of U.S. vehicle production will very likely continue to exceed 30 percent. Production of 3.4 million cars, trucks, and buses in this state at the next peak is well within reason. Production

TABLE 1

Details of Passenger Car Production in United States and Canadian Assembly Plants

State	City	Company	Line speed[a]	Model[b]	Production[c]
			UNITED STATES		
Michigan	Dearborn	Ford	50	Mustang, Capri	160,075
	Detroit	Chrysler	60[d]	Reliant, Aries, Dodge 400, Dodge 600, LeBaron, Chrysler E, Caravelle[e]	176,384
		GM	45	Cadillac[f]	156,618
	Detroit-Hamtramck[g]	GM	70[d]		—
	Flint	GM	100[h]	Regal, LeSabre, Electra	286,937
	Kalamazoo	Checker	n.a.	Checker	2,000[i]
	Lake Orion[j]	GM	70[d]		—
	Lansing	GM	120	Cutlass Supreme,[k] Olds 88, Olds 98	442,058
	Pontiac[l]	GM	60[d]		106,846
	Sterling Heights[m]	Chrysler	60[d]		—
	Wayne	Ford	66	Escort, Lynx	204,438
	Wixom	Ford	33	Lincoln, Mark VI, Continental	97,620
	Ypsilanti	GM	63	Skylark, Omega	184,962
State Total			772[n]		1,817,934
Missouri	Leeds	GM	54	Skyhawk, Firenze	106,186
	Kansas City	Ford	50	Fairmont, Zephyr	160,637
	St. Louis	Ford	36[p]	Grand Marquis	90,438
	Fenton	Chrysler	90[p]	LeBaron, 400, Reliant, Aries, Caravelle	101,448
	Wentzville[q]	GM	70[d]		—
State Total			264		458,709
Delaware	Wilmington	GM	70	Chevette, Acadian	198,578
	Newark	Chrysler	60	Aries, Reliant, LeBaron, Wagon	170,242
State Total			130		368,820
Georgia	Doraville	GM	60[d]	Century, Ciera	219,220
	Lakewood	GM	60[r]	Chevette, T1000	54,669
	Atlanta	Ford	50	LTD, Marquis, T-bird	60,776
State Total			170		334,665
California	Van Nuys	GM	54	Camaro, Firebird	205,490
	South Gate[s]				10,512
	Fremont	GM	60[d]		12,957[t]
	San Jose[u]	Ford		EXP, LN7, Escort, Lynx	68,783
State Total			114		297,742
Illinois	Chicago	Ford	50	LTD, Marquis	140,357
	Belvidere	Chrysler	60	Horizon, TC3, Omni, 024, Rampage, Scamp	150,028
State Total			110		290,385
Ohio	Lordstown	GM	70	Cavalier, J2000	95,042
	Norwood	GM	42	Camaro, Firebird	136,418
	Lorain	Ford	60	T-Bird, X-R7	39,926
	Marysville	Honda	60	Accord	—
State Total			232		271,386
New Jersey	Linden	GM	45	Riviera, Toronado, Eldorado, Seville	158,304
	Edison	Ford	53	Escort, Lynx	81,024
State Total			98		239,328
New York	Tarrytown	GM	60	Citation, Phoenix, Skylark	176,642
Texas	Arlington	GM	56	Malibu, Monte Carlo, Regal	164,863[v]
Kansas	Fairfax	GM	60	Buick, Olds, Chevrolet	158,298
Wisconsin	Janesville	GM	60	Cavalier, Cimarron	43,001
	Kenosha	AMC	60	Spirit, Concord, Eagle, Alliance	109,549
State Total			120		152,550
Maryland	Baltimore	GM	60[w]	Malibu, Monte Carlo, Grand Prix, Bonneville	107,925
Pennsylvania	New Stanton	VW	60	Rabbit	84,246
Oklahoma	Oklahoma City	GM	75	Citation, Century, Celebrity	79,109
Massachusetts	Framingham	GM	45	Celebrity, 6000	74,886

THE MICHIGAN ECONOMY

Bureau of Business Research
School of Business Administration
Wayne State University

JOHN G. MAURER
Dean
School of Business Administration

DAVID I. VERWAY
Director
Bureau of Business Research

DOREEN BRODER
Editor

GAIL GUIP
Secretary

DAVID L. WILLIAMS
Research Associate

ELENA DONADONI
SAFIUL HUDA
PARESH SHAH
Graduate Assistants

REVATHI BALASUBRAMANIAN
JOAN HAVRILLA
Student Assistants

Michigan Economic Indicators

Item	Year previous of latest month	Previous month	Latest month
Manufacturing workers:			
Average weekly hours, Michigan	40.5	40.7	41.3 (Dec.)
Average weekly hours, U.S.	39.9	39.3	39.7 (Dec.)
Average hourly earnings, Michigan ($)..	443.67	454.00	466.11 (Dec.)
Average hourly earnings, U.S. ($)	329.97	338.37	344.99 (Dec.)
U.S. motor vehicle production (units)	279,824	383,604	432,756 (Jan.)
Michigan electricity usage (mil. kwh.):			
Industrial (mil. kwh.)	2,444	2,251	2,099 (Nov.)
Residential (mil. kwh.)	1,634	1,592	1,635 (Nov.)
Raw steel production:			
Michigan (000 net tons)	612	360	448 (Dec.)
United States (000 net tons)	7,671	4,546	4,456 (Dec.)
Consumer price index (1967 = 100)			
Detroit area	278.3	296.0	292.6 (Dec.)
United States	281.5	293.6	292.4 (Dec.)
U.S. producer price index (1967 = 100)	275.4	284.9	285.1 (Dec.)
Michigan farm prices received index (1977 = 100)	135	116	116 (Dec.)

SOURCE: U.S. Bureau of the Census; U.S. Bureau of Labor Statistics; Michigan Crop Reporting Service; Ward's Automotive Reports; American Iron and Steel Institute; and Energy Information Administraton.

TABLE 1 (Continued)

State	City	Company	Line speed[a]	Model[b]	Production[c]
Kentucky	Bowling Greene (new)	GM	15	Corvette	22,838
TOTAL, United States			2,381[n]		5,100,326[v]
		CANADA			
Ontario	Oshawa	GM	100	Chevrolet, Pontiac, Celebrity, 6000	247,274
	Oakville	Ford	60	LTD	129,037
	St. Thomas	Ford	58	EXP, LN7	134,225
	Windsor[r]	Chrysler		Cordoba, Mirada, Imperial, Gran Fury, Diplomat, Caravelle, New Yorker	149,442
	Brampton	AMC	60	Concord, Eagle, Spirit	30,340
Province Total			278		690,318
Quebec	Ste. Therese	GM	45	Cutlass	86,374
Nova Scotia	Halifax	Volvo	6	DL, GL, GLT	10,118
TOTAL, Canada			329		786,810

SOURCE: The various companies.
a. Nominal line speed in cars per hour. This can vary depending on model mix and market requirements.
b. 1983 model year.
c. 1982 model year.
d. Author's estimates.
e. Caravelle is sold in Canada.
f. Beginning 1984 model year, rear-drive Cadillacs and Oldsmobiles will be sourced here.
g. Beginning 1985 model year, Cadillac Eldorado and Seville, Oldsmobile Toronado, and Buick Riviera will be sourced here. The plant is still under construction.
h. "Buick City" will be rated at 75.
i. Checker ceased production of vehicles in July 1982.
j. Beginning 1984 model year, large front-drive Cadillacs and the Oldsmobile 98 will be sourced here.
k. Beginning 1984 model year, N-body cars of Oldsmobile, Buick, and Pontiac will be sourced here.
l. During the 1982 model year, Pontiac Bonneville and Grand Prix were sourced here. During the 1984 model year the P car will be sourced here.
m. Large K cars will be produced beginning 1983.
n. Estimated 1986 model year capacity.
p. Ford plans to shift car production to Ontario in 1985 in order to produce its minivan in St. Louis. Chrysler is activating an idle truck plant to resume production of its rear-drive cars, formerly assembled in Windsor, new home of the T115 van.
q. Plant to begin producing Buick Electras and Oldsmobile 98s in fall 1983.
r. This plant is temporarily inactive.
s. This plant is permanently closed.
t. Joint GM-Toyota venture.
u. This plant will close permanently in May 1983.
v. Includes ElCamino and Caballero, classified as trucks in MVMA tabulations.
w. Plant is being converted to truck production.

of 4 million vehicles (the 1978 figure) does not pale the imagination. As a practical matter, this state's capacity is probably going to be 5 million units annually.

By way of historical precedent, it is instructive to compare 1982–86 with two similar periods. In 1931, Michigan factories produced 715,000 vehicles, a third of the U.S. total of 2,167,000 for that year and less than half the 1929 figure for this state. The 1929 national figure was 4,780,000. In 1935, about 1,735,000 vehicles were assembled here out of a U.S. total of 3,718,000. During the Great Depression, capacity had been trimmed outside of the industrial heartland.

In 1961, fewer than 2 million cars, trucks, and buses rolled from Michigan assembly lines, about two-thirds the figure of the previous peak (1955) and 29 percent of th U.S. total. In 1965, 3,750,000 vehicls were Michigan made, 34 percent of the U.S. figure for that year and nearly double this state's 1961 level of production. The story of this state's long domination of the U.S. vehicle industry and of its ups and downs is encapsulated in the numbers in Table 2.

TABLE 2
Production of Motor Vehicles in Michigan and the United States, Selected Years: 1904–1982

Year	Cars			Trucks and Buses		
	Michigan	United States	Percentage	Michigan	United States	Percentage
	(In thousands)					
1904	9	20	45	.1	1	7
1909	64	122	52	1	5	19
1914	437	544	80	6	25	24
1919	591	1,684	35	49	126	39
1921	441	1,406	31	32	106	31
1923	1,008	3,432	29	67	281	24
1925	1,280	3,581	36	126	342	37
1927	1,460	2,826	52	91	330	28
1929	1,595	4,388	36	82	392	21
1931	675	1,921	35	40	246	16
1935	1,587	3,213	49	148	505	29
1953	2,196	6,135	36	n.a.	n.a.	n.a.
1954	1,768	5,509	32	n.a.	n.a.	n.a.
1955	2,708	7,950	34	n.a.	1,254	n.a.
1956	1,917	5,808	33	n.a.	1,012	n.a.
1957	2,118	6,120	35	180	1,100	16
1958	1,239	4,247	29	153	873	18
1959	1,658	5,599	30	184	1,124	16
1960	2,092	6,703	31	203	1,202	17
1961	1,774	5,522	32	171	1,130	15
1962	2,280	6,943	33	228	1,254	18
1963	2,590	7,644	34	265	1,464	18
1964	2,622	7,745	34	385	1,562	25
1965	3,255	9,335	35	495	1,802	27
1966	3,024	8,605	35	515	1,792	29
1967	2,600	7,413	35	459	1,611	28
1968	3,009	8,849	34	511	1,972	26
1969	2,873	8,224	35	533	1,982	27
1970	2,099	6,550	32	454	1,734	26
1971	2,836	8,584	33	587	2,088	28
1972	2,902	8,828	33	734	2,483	30
1973	3,268	9,667	34	1,012	3,015	34
1974	2,403	7,325	33	897	2,747	33
1975	2,249	6,717	33	757	2,270	33
1976	2,914	8,498	34	1,030	3,000	34
1977	2,852	9,214	31	1,077	3,489	31
1978	2,706	9,177	29	1,288	3,723	35
1979	2,582	8,434	31	996	3,046	33
1980	1,732	6,376	27	443	1,634	27
1981	2,040	6,253	33	460	1,690	27
1982	1,818	5,073	36	577	1,913	30

SOURCE: Bureau of the Census, **Manufacturers 1905** (Washington, D.C.: Government Printing Office, 1908), Part IV, p. 272, and similar documents for years 1909-1935; **Automotive News**, Almanac Issue, 1954 through 1972; Ward's Communications, Inc., **Wards Automotive Yearbook**, 1958 through 1972 (Detroit: annually); Motor Vehicle Manufacturers Association, special release; and the various companies, 1972-1982 Michigan figures.
n.a.: not available.

THE 1978–82 DEBACLE

Anyone who has not worked with industry statistics published by the federal government and other organizations is probably a stranger to the Standard Industrial Classification (SIC) employed for classifying business establishments. The SIC is a system for classifying business establishments according to their major activity and product. A Census of Manufacturers pertains only to establishments whose major activity is manufacturing; although some establishments may engage in minor activities such as wholesaling, they are classified as manufacturers as long as manufacturing is their major activity. Within this sector, establishments are further categorized into particular industries on the basis of their major product. Each establishment falls into one and only one industry even though it may manufacture several products. Every industry is assigned a four-digit code number. When data are collected from manufacturing establishments, they are grouped for publication according to these SIC code numbers.

The next level of aggregation is the three-digit SIC, formed by combining related four-digit industries. SIC 371, for example, known as Motor Vehicles and Motor Vehicle Equipment, is comprised of SIC 3711 (Motor Vehicles and Passenger Car Bodies), SIC 3713 (Truck and Bus Bodies), SIC 3714 (Motor Vehicle Parts and Accessories), and SIC 3715 (Truck Trailers). At the last employment peak for Michigan, there were about 400,000 white- and blue-collar workers (wage and salary employed) in SIC 371, or 40 percent of the 1,000,000 U.S. workers so employed.

In 1981, Michigan State University's now defunct Bureau of Business and Economic Research surveyed supplier firms in an eight-county southeast Michigan region (Lapeer, Livingston, Macomb, Monroe, Oakland, St. Clair, Washtenaw, and Wayne counties). Except for GM, Ford, and Chrysler, all establishments with one hundred or more employees and one in ten of those with fewer employees were queried regarding their automobile activity. Of 1,769 establishments for which useable responses were received, 1,366 were directly linked to the automotive industry as suppliers.

The extent of Michigan's vast automotive infrastructure also was demonstrated in a 1981 survey by the Michigan Employment Security Commission. The MESC queried manufacturing establishments with one hundred or more employees regarding their automotive supplier activity. The results are shown in Table 3.

On the basis of the MSU and MESC studies it is estimated that there were 750,000 automotive-related man-

TABLE 3

Employment in All Motor-Vehicle-Related Manufacturing Industries in Michigan: March 1979 and March 1980

SIC code	Industry title	Percent motor-vehicle-related	Total employment March 1979	Total employment March 1980
2271	Woven Carpets & Rugs	100.0	*	*
2295	Coated Fabrics, Not Rubberized	100.0	*	*
2396	Automotive Trimmings	99.9	18,025	12,750
2399	Fabricated Textile Products, n.e.c.	93.7	*	*
2531	Public Building & Related Furniture	29.7	2,650	3,125
2851	Paints, Varnishes, & Allied Products	63.9	3,675	3,200
3011	Tires & Inner Tubes	100.0	*	*
3041	Rubber & Plastic Hose & Belting	78.2	850	250
3079	Misc. Plastic Products	66.7	27,500	25,900
3211	Flat Glass	92.3	*	*
3231	Glass Products	42.9	4,175	3,900
3296	Gaskets, Packing & Sealing Devices	60.0	1,600	1,350
3312	Blast Furnaces, Steel Works, & Rolling Mills	91.2	24,300	21,400
3321	Gray Iron Foundries	87.3	27,725	19,500
3322	Malleable Iron Foundries	94.0	6,150	4,325
3325	Steel Foundries, n.e.c.	28.8	1,850	1,850
3357	Drawing & Insulating of Nonferrous Wire	46.9	1,400	1,875
3361	Aluminum Foundries	45.4	4,400	3,900
3429	Hardware, n.e.c.	69.9	16,400	14,475
3451	Screw Machine Products	48.3	6,750	6,075
3452	Bolts, Nuts, Screws, Rivets, & Washers	83.2	4,550	4,225
3462	Iron & Steel Forgings	65.7	6,025	4,775
3465	Automotive Stampings	100.0	58,800	45,225
3493	Steel Springs, Except Wire	76.9	1,950	1,300
3519	Internal Combustion Engines	86.2	*	*
3555	Special Tools & Dies	72.6	27,450	26,275
3592	Carburetors, Pistons, Piston Rings, & Valves	74.4	6,450	5,575
3651	Radio & Television Receiving Sets	16.0	1,400	1,175
3691	Storage Batteries	100.0	*	*
3694	Elec. Equip. for Internal Combustion Engines	86.1	12,825	9,200
3711	Motor Vehicles & Passenger Car Bodies	100.0	238,400	209,750
3713	Truck & Bus Bodies	100.0	1,225	1,875
3714	Motor Vehicle Parts & Accessories	100.0	173,575	135,325
3715	Truck Trailers	100.0	*	*
	TOTAL		707,475	592,925

SOURCE: Michigan Employment Security Commission; Bureau of Research and Statistics, Motor Vehicle and Related Industries in Michigan, Summer 1981.
*Included in totals to avoid disclosure.
n.e.c. — not elsewhere classified.

ufacturing jobs in Michigan during the last quarter of 1978. This represented 19 percent of the state's total employment and did not include advertising, banking, insurance, trucking, railroads, and other nonmanufacturing jobs entailed in the provision of services to the auto industry. By the last quarter of 1982, the number of automotive-related manufacturing jobs in Michigan stood at about 525,000, a decline of 30 percent from the 1978 peak.

EMPLOYMENT PROSPECTS

Whereas ten years ago it meant better lighting at work stations and new paint on factory walls, these days quality of work life (QWL) is meaningful employee participation and involvement in decisions affecting their jobs. Management listens to and acts on the advice of its work force, who are intimately acquainted with the work flow. There is less emphasis on the urgency of keeping the production line going at all costs and more focus on the process itself and on human dignity. At upper echelons, management and labor have expressed their determination to build relationships based on trust, confidence, honesty, and openness. Reduced stress in the workplace is one outcome; high level, high quality production is another.

Participatory management starts with the blurring of class distinctions. There is one parking lot and one cafeteria to serve both hourly and salaried workers. Few salaried workers wear suits and neckties in today's QWL factory. In plants where it has been introduced, participatory management entails sharing of cost data and various other information once kept secret. Teamwork replaces lines of authority. Insofar as possible, the men and women at the machines decide who will do what. Foremen become coordinators and facilitators. Workers decide when the production process should be interrupted to make corrections; they are encouraged to consult directly with maintenance people, each other, or management to remedy defects before they become serious, as well as to improve products and processes. Job definitions are imprecise.

Labor projections also are affected by vehicle downsizing. In 1981, the University of Michigan, the Michigan Manufacturers Association, and Arthur Andersen and Co., with the participation of the Transportation Systems Center of the U.S. Department of Transportation, surveyed industry experts on the projected use of materials, with the following results:

Material (pounds per U.S. produced passenger car)	Actual 1980	Projected 1985	Projected 1990
Steel (low-carbon and HSLA)	1,900	1,600	1,300
Iron	500	300	250
Plastics (nonreinforced, fiber-reinforced, and metal laminate)	200	240	300
Aluminum (cast and wrought)	120	150	200
Glass	90	70	50
Other	490	340	150
Total	3,300	2,700	2,250

SOURCE: The University of Michigan and Arthur Andersen and Company, **U.S. Automotive Industry in the 1980s: A Domestic and Worldwide Perspective** (Detroit: 1981), p. 17.

Michigan's foundry, steel, forgings, and stampings industries already have been heavily affected by the sharp decline in automotive production and by downsizing. There is no likelihood of their returning to 1978 volumes of production even if unit production of vehicles returns to that level. Smaller engines are shrinking the

market for piston rings, bearings, and other machine parts, made in Michigan as well as other places.

Increasingly, robots are replacing human beings to do repetitive, dangerous, and undesirable jobs. According to a recent study by The W. E. Upjohn Institute for Employment Research, robotics will displace 30 to 40 percent of Michigan's production painter jobs in the automotive industry.[1] Among welders here, the job loss would lie in the 15–20 percent range. Total displacement from the blue-collar work force due to robotics would range between 5.1 percent and 8.6 percent, or between 10,000 and 18,000 of the 207,000 blue-collar workers employed in Michigan by GM, Ford, and Chrysler in 1978.

Robotics, participatory management, and process designs are revolutionizing the production process. Buick City, for example, will operate with nearly five thousand wage and salaried people as compared with about seven thousand now in the Buick and Fisher Body plants. In short, to survive as the automotive capital, Detroit must be far less extravagant with labor, materials, and working capital than it was in 1978. Fewer blue-collar jobs require fewer white-collar supporting jobs. Participatory management reduces the salaried-to-hourly worker ratio in the plants. The new management ethic of facile communications between top echelons and the plant floor requires fewer layers or levels of management. Finally, a subject not touched on so far, office automation is expected to thin the white-collar ranks.

Just-in-time production is expected to create new jobs. Recently the City of Detroit acquired idled, antiquated Chrysler facilities on its east side. The site will be prepared for an industrial park designed to attract suppliers not just to GM but to nearby Chrysler and Ford plants. Suppliers also are expected to locate in a new industrial park in Hamtramck and in similar parks and vacant factories throughout southern Michigan.

The automotive Big Three employed 500,000 people in this state in late 1978 and early 1979. As a result of downsizing products and streamlining operations, they are expected to employ 350,000 at the next peak (fall 1985) and to achieve unit production at the ten million unit level. These figures represent total employment, including nonmanufacturing and nonautomotive operations such as Ford's farm tractor plant in Romeo. Automotive manufacturing employment will decline from about 425,000 to 300,000. Suppliers employed around 325,000 in 1978. The streamlined industry, including new facilities to meet the just-in-time regimen, is expected to employ 300,000.

Given the U.S. Department of Commerce vehicle market analysis, there will be no more than 600,000 Michigan jobs entailed in the manufacture of vehicles and components in fall 1985. That figure represents a permanent loss of 150,000 such jobs from the 1978 peak.

It is instructive to review the 1961–65 experience from a productivity perspective. In 1961 the industry produced 10.5 vehicles per worker, not allowing for supplier industries to SIC 371. By 1965, the industry was making 13.2 vehicles per worker. In 1978, unit output per worker was actually marginally below the 1965 figure, and in 1982 it was below the 1961 figure. True, the 1961 vehicle was much less sophisticated than its 1981 counterpart, but it also was considerably more affordable by the typical U.S. household.

To find markets for ten million cars, trucks, and buses made in the United States, the industry very likely will have to exceed the 1978 level of unit output per worker. It is my guess that workers in SIC 371 will have to produce 15 units each on the average and of a higher quality than the 1978 or 1982 products. That implies 667,000 blue- and white-collar workers in SIC 371, of which about 45 percent or 300,000 would be in Michigan factories, offices, and so forth. If the industry can substantially improve its productivity to 17 units per worker, then the 1978 level of production seems attainable, implying about 750,000 jobs nationwide in SIC 371, of which 325,000 or 43 percent would be in Michigan factories. Total manufacturing employment entailed in vehicle production would approximate 650,000, still 100,000 or 13 percent short of the 1978 level.

A dramatic turnaround in productivity would justify the relatively high level of wages in the industry. For 1982, average hourly earnings for blue-collar workers in SIC 371 were $11.12. This was 45 percent above average hourly earnings for production workers in all private industry in this country. Data on average earnings for management are not readily available. However, they would reveal a greater percentage differential over SIC 371 and the rest of the private sector.

THE SHAPE OF 1986

At the low-wage, low-skill level, many Michigan jobs already have disappeared. They were lost with the closure of wiring harness plants in Atlanta, Standish, Sault Ste. Marie, Morley, and Clare. Those plants primarily employed women who were paid wages somewhat above the minimum to assemble electric wiring systems for motor vehicles. Closings also include muffler factories, small foundries and stampings plants, plastic extrusion plants, and various other components factories. These terminations resulted from the depressed market as well as the lure of Mexican labor at 85 cents per hour.

By the mid-1980s automotive electronics will be more popular. In luxury cars on-board computers will adjust seats and mirrors to suit the driver, issue warnings to intoxicated or drowsy drivers, and monitor trips in addition to controlling engine speed, warning of malfunction, and so forth. With a high proportion of luxury car production located here, Michigan can expect to attract foreign companies interested in increasing their shares of the Canadian and U.S. markets for automotive electronics. The industrial parks in southeast Michigan may also host plants that produce high value-added components for those luxury cars, styled and engineered to European standards. Turbo chargers, for example, will be required on engines made in Lansing, Flint, Pontiac, Livonia, Dearborn, and Detroit.

Detroit's suppliers will seek diversity in their markets. A link-up of office and automotive electronics is one logi-

THE MICHIGAN ECONOMY
Bureau of Business Research
School of Business Administration
Wayne State University
Detroit, Michigan 48202
Address Correction Requested

NON-PROFIT ORG.
U. S. POSTAGE
PAID
Detroit, Mich.
Permit No. 3844

cal outcome. Grand Rapids, after all, is the office furniture capital of the world.

Engines from Japan find their way into cars assembled in this country. Connecting rods from a factory in Dearborn are sent to an engine factory in Wales. The trend to global sourcing of components can be expected to continue, even though it contradicts the principle of just-in-time. What economists call economies of scale are partly responsible for this phenomenon. Today's engine factories, for example, are designed for optimum production of 500,000 or more automotive power plants annually. Rarely does a single vehicle assembly plant operate at that scale. Cost and risk-sharing are other reasons for global sourcing. Chrysler Corporation installs gasoline engines from its partner Mitsubishi because it cannot afford to build a separate plant. Ford will import diesel engines for its new Tempo and Topaz cars from its partner Toyo Kogyo for the same reasons. In short, the Michigan product of 1986 will incorporate a higher proportion of components made in Canada, Japan, Spain, Mexico, Germany, and other countries. In turn, factories here will export hydramatic transmissions, steering gear, engines, and other components in greater dollar volume than now.

Traditionally, virtually all of Ford's automotive research and development activity has taken place in Michigan. Ford's R & D efforts were augmented last year with the new Paint Research Center in Mount Clemens and the new Robotics and Automation Applications Consulting Center in Dearborn. Chrysler is consolidating its introl Division (instruments and electronics) in Huntsville, Alabama. Its major R & D activity is near headquarters in Highland Park, Michigan. Recently Chrysler converted its Eight Mile (Detroit) Stamping Plant to a manufacturing technology center. Warren, Michigan, is home of the GM Technology Center. GM also maintains considerable R & D activity at its divisional headquarters in Lansing (Oldsmobile), Flint (Buick, AC Spark Plug), Pontiac (Pontiac Motor, GM Truck and Bus Group), Detroit (Cadillac, Detroit Diesel Allison), Ypsilanti (Hydramatic), and Saginaw (Saginaw Steering Gear, Central Foundry). Suppliers such as Bendix, Budd, Eaton, and Sealed Power also conduct automotive R & D in the Wolverine State.

These activities are reflected in patent statistics. Of the ten companies which were granted twenty or more patents with a Michigan origin in 1980, five were in the automotive business.

Company	Number of patents	
	Michigan	United States
General Motors	188	326
Upjohn	148	170
Dow	144	259
Ford Motor	133	145
BASF	47	56
Bendix	43	131
Eaton	42	104
Dow Corning	26	31
Chrysler	23	25
Ethyl	23	50

These companies accounted for 429 or 20 percent of the 2,167 patents granted in Michigan that year; they accounted for 59 percent of the patents granted to the companies. The underlying patent data show that 25–30 percent of the patents granted in Michigan are related to motor vehicles, 20–25 percent to pharmaceuticals and other chemicals, and 15–20 percent to machinery, including materials handling equipment. Historically, 13–14 percent of all privately funded R & D spending in the nation has taken place in Michigan. With the need to keep abreast of new automotive and production technology, that share will increase by middecade. However, because of the rapid productivity gains made possible by computers, the ranks of engineers and scientists will thin in companies already here, providing a source of skilled labor for newcomers.

In summary, Michigan's automotive industry will be more fully integrated into the global automotive industry, more technology oriented, and less labor intensive at all skill levels than it was in 1978. Displaced skilled workers, white- and blue-collar, will find employment with companies that expand or relocate here, or they will leave for jobs in other states. Displaced unskilled workers will find the transition more difficult, especially those that are over fifty, male, and black.

NOTES

1. H. Allan Hunt and Timothy L. Hunt, *Robotics, Human Resource Implications for Michigan, A Summary* (Kalamazoo: The W. E. Upjohn Institute for Employment Research, 1982), p. 6.

8/5/83 U9660-2 A

THE MICHIGAN ECONOMY

Volume 2 No. 3
MARCH-APRIL 1983

Published by the
Bureau of Business Research
School of Business
Administration
The Prentis Building

Wayne State University

DETROIT,
MICHIGAN 48202

Published bimonthly. Third class postage paid at Detroit, Michigan.

ISSN: 0730-272X

OUTLOOK FOR THE OUTSTATE SMSAs

by GEORGE A. FULTON, *assistant research scientist, and* DONALD R. GRIMES, *research associate, Institute of Labor and Industrial Relations, University of Michigan*

It is now evident that the 1981–82 national recession has run its course, with the end point occurring in December of 1982. According to the scenario put forth in this article, the ensuing recovery in 1983 will be led by consumer demand and will be relatively mild by historical standards in the initial stages, with much stronger growth expected by the second half of 1983. Of critical interest to the residents of Michigan is how such a scenario of the national economy would translate into local economic prospects, particularly in terms of labor markets.

The focus of this article is the outlook over the next two years for the labor markets in the eleven Standard Metropolitan Statistical Areas outside of the Detroit area (collectively referred to as the "outstate SMSAs"). Approximately one-half of the workers in Michigan are employed outside of greater Detroit, with three-quarters of those employed in metropolitan areas ranging in size from Grand Rapids to Bay City. This "urban belt," stretching across the southern Lower Peninsula, is dominated on the east by automotive production but is more diversified on its western side. (A breakdown of SMSAs by county can be found in Table 1.)

TABLE 1: Outstate SMSAs of Michigan

SMSA	Counties
Southeast	
Ann Arbor-Ypsilanti	Washtenaw
Bay City	Bay
Flint	Genesee, Shiawassee
Jackson	Jackson
Lansing-East Lansing	Clinton, Eaton, Ingham, Ionia
Saginaw	Saginaw
Southwest	
Battle Creek	Barry, Calhoun
Benton Harbor	Berrien
Grand Rapids	Kent, Ottawa
Kalamazoo-Portage	Kalamazoo, Van Buren
Muskegon-Norton Shores-Muskegon Heights	Muskegon, Oceana

Further information on the forecasts, the forecasting system, and the economic characteristics of Michigan, Detroit, and the outstate SMSAs is provided in the following publication:

A Regional Econometric Forecasting System: Major Economic Areas of Michigan

by Harold T. Shapiro and George A. Fulton

Available Fall 1983 from the University of Michigan Press, Ann Arbor, MI 48109.

A system of regional econometric models has been designed and implemented in conjunction with a computer simulation program at the Institute of Labor and Industrial Relations (ILIR), University of Michigan, in order to generate forecasts of employment and unemployment activity for each of the major urban areas in Michigan. A set of two-year forecasts was produced in May 1983, and the results for the outstate SMSAs are summarized in the following sections.

NATIONAL OUTLOOK

The local outlook is conditional on the expected course of events in the national economy. The projected paths of certain national economic indicators that serve as key inputs to the local models were provided by the Research Seminar in Quantitative Economics (RSQE), University of Michigan. These national inputs to the outstate SMSA forecasts for 1983 and 1984 are summarized in Table 2.[1] The inputs were supplemented where necessary with forecasts from an auxiliary national model developed at ILIR.

The RSQE forecast (dated May 1983) portrays a recovery in 1983 and 1984 from a prolonged and costly recession that began in mid-1981. This recovery is characterized by a consumer-led increase in final demand, resulting from increased levels of purchasing power, lower interest rates, and improved liquidity accompanying reduced levels of consumer debt.

On a calendar-year basis, the inflation-adjusted Gross National Product (real GNP) is expected to grow by 3.4 percent from 1982 to 1983 and by 6.1 percent from 1983 to 1984. As a consequence, the recovery phase is anticipated to proceed more slowly than those following the last two prominent downturns (1975–76 and 1958–59) when growth rates for real output in the initial year of recovery were in the range of 5.5 percent to 6.0 percent. The rate of real GNP growth is expected to accelerate rapidly in the second half of 1983 and early 1984 as the recovery diffuses to other sectors of the economy and business capital spending turns up. Although the economy is forecast to expand throughout 1984, the pace of recovery slackens over the year.

The housing and automotive sectors are important components of the predicted expansion, responding to the expected increase in consumer purchasing power and lower interest rates. Housing starts are projected to increase from an average annual rate of 1.2 million units in the second half of 1982 to a rate of 2.0 million units in 1984. Automobile sales are forecast to increase from an average annual rate of 8.2 million units to 10.3 million units between the last half of 1982 and the end of 1984. Further detail on this national economic scenario is provided in Table 2.

LOCAL OUTLOOK

Economic forecasting on a local level is a challenging endeavor, complicated by the problems of limited data availability and sensitivity of the economic profiles to actions of individual firms. ILIR is attempting to provide additional information on the prospects for the local economies in Michigan by implementing a regional econometric forecasting system. The labor market outlook for the outstate SMSAs in 1983 and 1984, as suggested by this forecasting system in conjunction with the national economic scenario, is summarized in the remaining tables in this article.

The employment situation in the "urban" regions of Michigan is forecast to improve considerably over the 1983–84 period. Details of these projected improvements are presented in Tables 3 and 4, which also show the severe decline in employment experienced between 1979 and 1982 when an average of one in every eleven jobs was lost in the outstate SMSAs. The average rates of job loss per year over the last three years and the projections of average annual job growth over the next two years are reported for each outstate SMSA in Table 3. The statistics used for 1979 and 1982 in the computations are estimates provided by the Michigan Employment Security Commission and are based on the 1982 benchmark. The rank order of the 1982–84 growth rates over the eleven SMSAs is shown in the last column. For comparative purposes, the SMSAs are listed in the table in descending order of their concentration in motor vehicle employment.

The outstate "urban" region as a whole is forecast to realize an average per year growth in jobs of 3.2 percent from 1982 to 1984, a substantial improvement over an average loss of jobs of 3.0 percent per year from 1979 to 1982. Traditionally, consumer led recoveries have promoted stronger growth in the automobile based economies situated in the southeastern section of the state

TABLE 2. National Input Variables to the Outstate SMSA Forecasts

Input variables	Calendar year			1982 (Actual)	1983		1984	
	1982 (Actual)	1983	1984	July–Dec.	Jan.–June	July–Dec.	Jan.–June	July–Dec.
% change at annual rate*								
Real GNP (% change)	−1.7	3.4	6.1	0.6	2.7	7.5	6.3	4.3
GNP deflator (% change)	6.0	4.6	4.3	4.6	4.9	4.0	4.2	4.7
Industrial production, manufacturing (% change)	−8.5	6.0	13.1	−4.1	5.4	17.9	13.6	7.6
Level in period								
Auto sales (millions)	8.0	9.0	10.1	8.2	8.5	9.5	9.9	10.3
Housing starts (millions)	1.1	1.8	2.0	1.2	1.7	1.9	2.0	2.0
Aaa corporate rate (%)	13.8	11.3	10.7	12.8	11.6	11.1	10.8	10.7
Unemployment rate (%)	9.7	9.9	8.0	10.3	10.3	9.5	8.3	7.7

*Percentage changes in the first three columns are from the previous calendar year to the indicated calendar year. Percentage changes in the last five columns are from the previous half year to the indicated half year, scaled to annual rates.
SOURCE: Research Seminar in Quantitative Economics, The University of Michigan, May 1983.

TABLE 3: Average Annual Growth Rates in Jobs for the Outstate SMSAs: 1979–82 and 1982–84

Region*	Average annual growth rates (%) 1979–82 (actual)	1982–84 (projected)	Rank order of projected 1982–84 growth rates
Flint	−5.1	4.8	1
Saginaw	−5.3	3.6	4
Lansing	−1.9	2.9	6
Ann Arbor	−2.7	3.9	2
Bay City	−3.3	3.1	5
Jackson	−5.0	0.4	11
Southeast	−3.7	3.5	
Benton Harbor	−5.0	1.5	9
Kalamazoo	−1.9	1.7	8
Muskegon	−3.0	1.0	10
Grand Rapids	−1.2	3.8	3
Battle Creek	−3.4	2.2	7
Southwest	−2.2	2.7	
Total outstate	−3.0	3.2	

*The regions are listed in descending order of their concentration in motor vehicle employment.

and somewhat less growth in the southwest. The recovery predicted for 1983–84 follows this geographic pattern, with the average annual growth rate in jobs projected to be 3.5 percent in the southeast (excluding Detroit) and 2.7 percent in the southwest. However, with employment declines of 3.7 percent per year in the southeast and 2.2 percent per year in the southwest over the three-year period from 1979 to 1982, these regions are not expected to regain 1979 job levels by the end of 1984.

Employment recovery in the individual SMSAs from 1982 to 1984 is forecast to range from an average annual increase of approximately 5 percent in Flint to virtually no change in Jackson. Five of the six local economies in the southeast are projected to experience the highest rates of job growth among the eleven SMSAs. The remaining area in the southeast, Jackson, is predicted to be the lowest ranking SMSA, as it was in the period following the last recession (1975–77). Conversely, Grand Rapids, the most populated area in the southwest region of the state, is characterized as being one of the highest growth areas among the SMSAs. This diversified and relatively healthy local economy also realized one of the largest expansions among all SMSAs in the state during the last recovery period.

These growth patterns in employment over the 1979–84 period can also be translated into changes in job levels. For each SMSA the actual net job loss from 1979 to 1982, the projected net job recovery from 1982 to 1984, and the predicted net change in jobs between 1979 and 1984 are reported in Table 4. The outstate "urban" region as a whole is forecast to realize an increase of 75,600 jobs from the average levels experienced in 1982 to those predicted for 1984. This projected expansion, however, involves the recovery of only two out of every three jobs lost between 1979 and 1982, leaving the area economies with 37,900 fewer jobs in 1984 than existed in 1979.

Most of this shortfall from 1979 employment levels (29,900 out of the 37,900 jobs) is expected to occur in the southeast region. Athough this region is forecast to regain more jobs over the next two years than the southwest (46,400 jobs versus 29,200 jobs), over twice as many jobs were lost in the southeast from 1979 to 1982. The only SMSAs forecast to realize net job gains on a calendar-year basis between 1979 and 1984 are Grand Rapids (10,300) and Lansing (200). The remaining areas are anticipated to regain jobs lost in the recession at rates that vary from one job in twenty in Jackson and one job in five in Benton Harbor and Muskegon to 93 percent of the jobs lost in Ann Arbor. Complete details are provided in Table 4.

TABLE 4: Net Changes in Job Levels for the Outstate SMSAs: 1979–84

Region*	1979–82 Net job loss (actual)	1982–84 Net job recovery (projected) Jobs	% Recovery from 1979	1979–84 Net job change (projected)
Flint	−29,400	16,900	57	−12,500
Saginaw	−13,600	5,700	42	−7,900
Lansing	−10,700	10,900	102	200
Ann Arbor	−11,300	10,500	93	−800
Bay City	−3,400	2,000	59	−1,400
Jackson	−7,900	400	5	−7,500
Southeast	−76,300	46,400	61	−29,900
Benton Harbor	−9,200	1,700	18	−7,500
Kalamazoo	−6,100	3,700	61	−2,400
Muskegon	−5,500	1,100	20	−4,400
Grand Rapids	−9,800	20,100	205	10,300
Battle Creek	−6,600	2,600	39	−4,000
Southwest	−37,200	29,200	78	−8,000
Total outstate	−113,500	75,600	67	−37,900

*The regions are listed in descending order of their concentration in motor vehicle employment.

DYNAMIC PATH OF THE LOCAL OUTLOOK

One difficulty with summarizing the outlook using information based on calendar-year averages is that the underlying dynamic paths are masked. Since the forecasting system developed at ILIR generates quarterly information, more details can be provided on the patterns of the projected employment paths. The quarterly employment statistics were seasonally adjusted by the authors by means of the Census X-11Q Program and then were averaged for each half of the calendar year (that is, January through June and July through December of each year). The results from 1982 to 1984 for each outstate SMSA are presented in Table 5. The corresponding percentage changes are also provided and are stated in terms of annual rates for ease of comparison with other statistics in this article.

The statistics for the outstate SMSAs in total indicate that the decline in jobs decelerates in the second half of 1982, followed by a modest increase predicted for the first half of 1983. By the second half of 1983 substantial job recovery is under way, averaging a 5 percent seasonally adjusted annual rate across the areas. This rate of recovery accelerates to 5.5 percent in the first half of 1984 and to 5.8 percent in the second half of the year.

This recovery is led by the manufacturing sector, as might be expected from the national outlook and the

THE MICHIGAN ECONOMY

Bureau of Business Research
School of Business Administration
Wayne State University

JOHN G. MAURER
Dean
School of Business Administration

DAVID I. VERWAY
Director
Bureau of Business Research

DOREEN BRODER
Editor

GAIL GUIP
Secretary

DAVID L. WILLIAMS
Research Associate

ELENA DONADONI
SAFIUL HUDA
PARESH SHAH
Graduate Assistants

REVATHI BALASUBRAMANIAN
JOAN HAVRILLA
Student Assistants

Michigan Economic Indicators

Item	Year previous of latest month	Previous month	Latest month
Manufacturing workers:			
Average weekly hours, Michigan	39.9	41.4	41.6 (Mar.)
Average weekly hours, U.S.	39.1	38.8	39.6 (Mar.)
Average hourly earnings, Michigan ($)	11.11	11.40	11.39 (Mar.)
Average hourly earnings, U.S. ($)	8.37	8.74	8.75 (Mar.)
U.S. motor vehicle production (units)	662,670	659,980	796,232 (Mar.)
Michigan electricity usage (mil. kwh.):			
Industrial (mil. kwh.)	2,313	2,039	2,031 (Dec.)
Residential (mil. kwh.)	1,978	1,635	1,956 (Dec.)
Raw steel production:			
Michigan (000 net tons)	827	561	675 (Mar.)
United States (000 net tons)	11,744	5,676	7,127 (Mar.)
Consumer price index (1967 = 100)			
Detroit area	278.2	292.3	292.4 (Mar.)
United States	283.1	293.2	293.4 (Mar.)
U.S. producer price index (1967 = 100)	298.0	301.2	300.5 (Mar.)
Michigan farm prices received index (1977 = 100)	137	119	119 (Mar.)

SOURCE: U.S. Bureau of the Census; U.S. Bureau of Labor Statistics; Michigan Crop Reporting Service; Ward's Automotive Reports; American Iron and Steel Institute; and Energy Information Administraton.

Contracts for Future Building, First 3 Months: 1982 and 1983

(Thousands of Dollars)

Area	Nonresidential			Residential			Total[a]		
	1982	1983	Percentage change	1982	1983	Percentage change	1982	1983	Percentage change
Ann Arbor	24,229	12,556	− 48	2,019	4,788	+ 137	16,248	17,344	− 34
Battle Creek	9,882	2,160	− 78	1,778	1,904	+ 7	11,660	4,064	− 65
Bay City	400	292	− 27	723	2,096	+ 190	1,123	2,388	+ 113
Detroit	98,732	90,326	− 9	35,474	88,472	+ 149	134,206	178,798	+ 33
Flint	6,005	6,014	—	5,723	3,533	− 38	11,728	9,547	− 19
Grand Rapids	15,142	14,343	− 5	10,984	25,682	+ 134	26,126	40,025	+ 53
Jackson	2,832	1,782	− 37	965	4,102	+ 325	3,797	5,884	+ 55
Kalamazoo-Portage	101,864	3,055	− 97	5,987	5,451	− 9	107,851	8,506	− 92
Lansing-East Lansing	4,335	13,399	+ 209	4,349	11,681	+ 169	8,684	25,080	+ 189
Muskegon-Norton Shores-Muskegon Heights	98	1,950	+4,349	1,207	5,083	+ 321	1,305	7,033	+ 439
Saginaw	1,310	2,316	+ 77	1,350	2,112	+ 56	2,660	4,428	+ 66
Toledo	30,297	29,797	− 2	8,518	18,941	+ 122	38,815	48,738	+ 26
Michigan	277,792	177,664	− 36	96,355	206,380	+ 114	374,147	384,044	+ 3

SOURCE: F. W. Dodge Division of McGraw-Hill Information Systems Company, news releases.

Note: Battle Creek includes Barry and Calhoun counties; Detroit includes Lapeer, Livingston, Macomb, Oakland, St. Clair, and Wayne counties; Flint includes Genesee and Shiawassee counties; Grand Rapids includes Kent and Ottawa counties; Kalamazoo-Portage includes Kalamazoo and Van Buren counties; Lansing-East Lansing includes Clinton, Eaton, Ingham, and Ionia counties; Muskegon-Norton Shores-Muskegon Heights includes Muskegon and Oceana counties; and Toledo includes Monroe County, Michigan, and Fulton, Lucas, Ottawa, and Wood counties, Ohio.

a. Excludes nonbuilding construction contracts. This category comprises streets and highways, bridges, dams, reservoirs, river and harbor developments, sewerage and water supply systems, missile and space flight facilities, airports, utilities, and communication systems. For Michigan the 1982 and 1983 figures for nonbuilding construction contracts were $111,556,000 and $99,946,000 respectively, or a decrease of 10 percent.

historical patterns of recovery in Michigan. Automotive activity is the main source of improvement in the manufacturing sector, as implied by the differentials in the rates of recovery between the southeast and southwest regions.

In terms of the individual SMSAs, there is a mixed performance forecast for the first half of 1983, with five of the areas realizing an expansion in jobs and the remaining six areas experiencing a continuation of the declines. Every SMSA in the state is expected to realize sustained positive growth from the second half of 1983 through the second half of 1984, but at widely varying rates. Most of the areas achieve their highest rates of growth over the forecast horizon in the second half of 1984. Additional details on the specific employment paths projected for each SMSA are given in Table 5.

TABLE 5: Forecast of Total Jobs in Outstate SMSAs: Half-Year Averages, Seasonally Adjusted, 1982–84 (Percentage changes at annual rates)

Region	1982 (actual)		1983		1984	
	Jan.–June	July–Dec.	Jan.–June	July–Dec.	Jan.–June	July–Dec.
Ann Arbor	131,900	129,100	127,400	132,500	137,800	144,100
%	−2.7	−4.2	−2.6	8.2	8.2	9.4
Battle Creek	60,100	59,400	59,800	61,000	61,600	63,000
%	−4.8	−2.3	1.4	4.1	2.0	4.6
Bay City	32,500	31,900	31,600	33,000	33,900	34,600
%	−8.1	−3.7	−1.9	9.1	5.5	4.2
Benton Harbor	56,300	54,000	54,200	54,900	56,200	57,600
%	−7.7	−8.0	0.7	2.6	4.8	5.0
Flint	173,900	170,700	174,700	179,900	187,200	191,300
%	−10.8	−3.6	4.7	6.0	8.3	4.4
Grand Rapids	262,400	260,400	262,500	270,700	276,800	286,200
%	−3.9	−1.5	1.6	6.3	4.6	6.9
Jackson	48,200	45,900	45,300	45,900	46,900	47,900
%	−8.9	−9.3	−2.6	2.7	4.4	4.3
Kalamazoo	106,200	103,900	103,500	105,000	107,800	109,800
%	−5.6	−4.3	−0.8	2.9	5.4	3.7
Lansing	184,600	183,200	186,500	188,900	192,600	197,200
%	−8.1	−1.5	3.6	2.6	4.0	4.8
Muskegon	57,200	55,900	54,900	55,800	56,900	58,500
%	−2.1	−4.5	−3.5	3.3	4.0	5.7
Saginaw	76,900	77,000	76,700	78,800	81,200	84,000
%	−12.5	0.3	−0.8	5.6	6.2	7.0
Southeast	648,000	637,800	642,200	659,000	679,600	699,100
%	−8.4	−3.1	1.4	5.3	6.3	5.8
Southwest	542,200	533,600	534,900	547,400	559,300	575,100
%	−4.6	−3.1	0.5	4.7	4.4	5.7
Total outstate	1,190,200	1,171,400	1,177,100	1,206,400	1,238,900	1,274,200
%	−6.7	−3.1	1.0	5.0	5.5	5.8

INDUSTRIAL OUTLOOK FOR THE LOCALITIES

Further insight into the recovery process can be gained by considering the underlying industrial composition of the projections. The ILIR forecasting system enables employment projections for approximately twenty-five separate industries in each SMSA. For the purpose of this article the industry job forecasts were allocated to three major industrial sectors: manufacturing, private nonmanufacturing, and government.

The average annual employment levels by industrial sector in each SMSA are presented for 1982 (MESC data), 1983, and 1984 in Table 6. The growth rates from the previous year to the indicated year are shown below the corresponding employment numbers. In addition, a set of unemployment rate forecasts for each SMSA is provided. The track record of the forecasting system indicates that manufacturing-industry employment projections generally have been more accurate than those for nonmanufacturing, while the government sector is typically the most difficult to track. Also, much higher levels of accuracy have been achieved in predicting employment than unemployment.

As might be expected from the previous results, industry detail across SMSAs follows the same general pattern. Since the recovery is led by the manufacturing sector and in particular the automotive industry, the expansion of manufacturing employment through 1984 is much more pronounced in the southeast region. In terms of the individual SMSAs, the highest rates of growth in manufacturing employment are projected to occur in five of the six southeastern SMSAs. (Jackson is the exception.) The four largest SMSAs (Grand Rapids, Flint, Lansing, and Ann Arbor) are forecast to have the greatest increases in the number of manufacturing jobs between 1982 and 1984, ranging from five thousand to eleven thousand. Grand Rapids is anticipated to recover — in number — all of its manufacturing jobs lost since 1979. At the other end of the spectrum is Jackson, which is expected to make no net gains on its manufacturing employment losses since 1979. The remaining areas in descending order of manufacturing job recovery are: Lansing (68%), Bay City (54%), Ann Arbor (48%), Flint (47%), Kalamazoo (46%), Saginaw (33%), Muskegon (18%), Battle Creek (17%), and Benton Harbor (13%). It should be noted that the manufacturing-industry projections reflect the expected departure or scaling down of a number of manufacturing concerns.

By 1984 the recovery depicted in the regional forecast has diffused into the private nonmanufacturing sector, albeit at much lower rates of growth than in the manufacturing sector. A significant rebound in construction activity is forecast for many of the SMSAs, especially involving general building and special trade contractors in the residential construction market. The largest increase in nonmanufacturing jobs in terms of numbers, however, is expected to be in the service industries.

As in the case of manufacturing, the four largest SMSAs are expected to experience the greatest increase in employment over the 1982–84 period, ranging from twenty-seven hundred to eighty-two hundred jobs. With the exception of Ann Arbor and Grand Rapids, every SMSA suffered net losses in nonmanufacturing jobs between 1979 and 1982. All but two of these SMSAs are predicted to recoup their losses by 1984. Jackson and Benton Harbor are expected to fall short of 1979 levels by twenty-one hundred and nine hundred nonmanufacturing jobs, respectively.

Government employment levels are forecast to remain relatively stationary across the SMSAs from 1982 to 1984 with a mixture of small losses and small gains. Ann Arbor is the only SMSA forecast to exceed 1979 government employment levels in 1984. Over 90 percent of

TABLE 6: Annual Forecast for the Outstate SMSAs: Employment by Major Sector and Unemployment Rates, 1982–84*

Region	1982 (actual)					1983					1984				
	Total	Man.	Nman.	Govt.	U Rate	Total	Man.	Nman.	Govt.	U Rate	Total	Man.	Nman.	Govt.	U Rate
Ann Arbor	130,500	31,900	54,500	44,100	9.9	130,000	31,000	55,100	43,900	9.6	141,000	39,000	57,200	44,800	7.3
%	−4.1	−11.6	−1.3	−1.6	2.1	−0.4	−2.8	1.1	−0.5	−0.3	8.5	25.8	3.8	2.1	−2.3
Battle Creek	59,700	18,000	29,800	11,900	16.1	60,500	18,100	30,500	11,900	14.8	62,300	19,000	31,200	12,100	11.9
%	−3.9	−8.2	−2.0	−1.7	4.7	1.3	0.6	2.3	0.0	−1.3	3.0	5.0	2.3	1.7	−2.9
Bay City	32,200	8,400	18,900	4,900	16.0	32,300	8,800	18,900	4,600	16.0	34,200	9,700	19,800	4,700	12.0
%	−6.4	−7.7	−5.0	−9.3	3.6	0.3	4.8	0.0	−6.1	0.0	5.9	10.2	4.8	2.2	−4.0
Benton Harbor	55,200	19,100	28,400	7,700	16.3	54,600	18,700	28,500	7,400	17.0	56,900	19,900	29,600	7,400	13.5
%	−6.4	−9.5	−3.7	−8.3	3.3	−1.1	−2.1	0.4	−3.9	0.7	4.2	6.4	3.9	0.0	−3.5
Flint	172,300	61,900	83,100	27,300	20.8	177,300	65,400	84,800	27,100	16.9	189,200	72,800	88,800	27,600	13.1
%	−8.2	−14.7	−4.4	−3.2	5.7	2.9	5.7	2.0	−0.7	−3.9	6.7	11.3	4.7	1.8	−3.8
Grand Rapids	261,300	85,000	146,700	29,600	11.8	266,600	88,600	148,400	29,600	10.3	281,400	96,100	154,900	30,400	7.4
%	−2.5	−5.7	−0.3	−3.3	2.7	2.0	4.2	1.2	0.0	−1.5	5.6	8.5	4.4	2.7	−2.9
Jackson	47,000	12,000	27,000	8,000	16.3	45,700	11,000	26,700	8,000	17.0	47,400	11,900	27,400	8,100	14.6
%	−7.5	−15.5	−4.3	−4.8	4.8	−2.8	−8.3	−1.1	0.0	0.7	3.7	8.2	2.6	1.3	−2.4
Kalamazoo	105,100	31,200	54,500	19,400	11.0	104,300	31,100	54,000	19,200	10.4	108,800	33,400	55,900	19,500	8.0
%	−4.1	−5.5	−3.9	−2.5	2.3	−0.8	−0.3	−0.9	−1.0	−0.6	4.3	7.4	3.5	1.6	−2.4
Lansing	184,000	37,200	83,400	63,400	12.1	187,700	38,800	85,900	63,000	11.2	194,900	42,300	89,100	63,500	8.8
%	−4.5	−9.0	−3.5	−3.1	1.9	2.0	4.3	3.0	−0.6	−0.9	3.8	9.0	3.7	0.8	−2.4
Muskegon	56,600	18,600	28,300	9,700	17.7	55,400	18,100	28,200	9,100	18.0	57,700	19,300	29,200	9,200	14.5
%	−3.1	−6.5	0.0	−4.9	4.0	−2.1	−2.7	−0.4	−6.2	0.3	4.2	6.6	3.5	1.1	−3.5
Saginaw	76,900	24,200	41,500	11,200	17.1	77,800	24,700	41,800	11,300	14.4	82,600	28,100	43,100	11,400	10.4
%	−8.2	−17.4	−3.9	−0.9	5.0	1.2	2.1	0.7	0.9	−2.7	6.2	13.8	3.1	0.9	−4.0
Southeast	642,900	175,600	308,400	158,900	15.3	650,800	179,700	313,200	157,900	13.6	689,300	203,800	325,400	160,100	10.5
%	−6.2	−13.2	−3.6	−2.8	3.7	1.2	2.3	1.6	−0.6	−1.7	5.9	13.4	3.9	1.4	−3.1
Southwest	537,900	171,900	287,700	78,300	13.3	541,400	174,600	289,600	77,200	12.4	567,100	187,700	300,800	78,600	9.4
%	−3.4	−6.4	−1.5	−3.6	3.1	0.7	1.6	0.7	−1.4	−0.9	4.7	7.5	3.9	1.8	−3.0
Total outstate	1,180,800	347,500	596,100	237,200	14.4	1,192,200	354,300	602,800	235,100	13.1	1,256,400	391,500	626,200	238,700	10.0
%	−5.0	−10.0	−2.6	−3.1	3.5	1.0	2.0	1.1	−0.9	−1.3	5.4	10.5	3.9	1.5	−3.1

*The first row for each SMSA indicates the average level of employment and the unemployment rate (%) for the calendar year. The second row contains the annual growth rate (%) from the previous year to the indicated year, except for the unemployment rate, which is expressed in terms of nominal differences. The values for 1982 are estimates provided by the Michigan Employment Security Commission and are based on the 1982 benchmark. The forecast date is May 1983.

the government workers located in the outstate SMSAs are employed in the state or local government divisions. The problems of revenue shortfall plaguing the state government have been well advertised lately, and some staff reductions have been proposed. Public universities and colleges, comprising a large part of state government in several of the SMSAs, are in the process of reorganization in order to adjust to a falling share of state support. A large portion of local government employment in the SMSAs is associated with public school education, and this sector is also having to adapt to ongoing revenue constraints and declining enrollment.

The unemployment situation is expected to improve over the forecast horizon, ranging from a 1.7 percentage-point decline in Jackson to a 7.7 percentage-point decline in Flint between 1982 and 1984. The unemployment rates across SMSAs, however, are expected to remain higher in 1984 than in 1979, with percentage-point differentials ranging from 1.5 (Ann Arbor) to 7.4 (Jackson). This situation results in large part from the addition of job seekers to the labor force.

SUMMARY

A system of regional econometric models has been constructed at the Institute of Labor and Industrial Relations, University of Michigan, in order to produce forecasts of labor market activity for the SMSAs of Michigan. This article reports on the results of a two-year forecast generated for the outstate SMSAs in May 1983. The forecast shows job recovery across all of the areas by the second half of 1983, with some acceleration of the increase in jobs during 1984. The recovery is led by the manufacturing sector, which displays the most rapid growth in the automobile-based economies located in the southeast region of the state.

From 1979 to 1982, 113,500 jobs were lost in the outstate SMSAs, 76,300 of these in the southeast. During 1983 and 1984, the extent of the forecast horizon, it is predicted that 75,600 jobs will be regained. This leaves a shortfall from 1979 levels of 37,900 jobs — 29,900 in the southeast and 8,000 in the southwest.

The local-area forecast is predicated on an economic recovery at the national level, where strong growth is projected for the second half of 1983 and for 1984. Although it is evident that this national economic recovery is under way in the first quarter of 1983, the recovery path may be disturbed by unfavorable developments in federal fiscal policy or by the actions of the Federal Reserve Board. Specifically, the forecasts at both the national and local levels are contingent upon a decline in the federal budget deficit, a moderate expansion of the money supply over the forecast period, and continuation of a lower interest-rate regime for the private economy.

NOTE

1. The authors would like to express their appreciation to Saul H. Hymans and Joan P. Crary for this information and for their ongoing support of the regional forecasting efforts.

Brief

Michigan manufacturers spent $3.6 billion on research and development (R & D) during 1979 according to the most recent tabulations by the National Science Foundation. That figure represented 9.5 percent of the $38 billion national total. By way of comparison, Michigan contains about 4 percent of the nation's population, and in a typical year approximately 6 percent of manufacturing activity takes place here.

The federal government sponsored nearly a third of the nation's industrial R & D; most government sponsored R & D is devoted to missiles, aircraft, and other military applications. Michigan accounted for approximately 1 percent of federally funded R & D. Of the remainder, the $25.5 billion in company funded R & D, $3.4 billion or over 13 percent was spent in the Wolverine State.

Basic research, defined as scientific investigation conducted primarily for enlarging the fund of human knowledge, represented $1.1 billion or 3 percent of the national R & D total; $7.2 billion (19 percent) was spent on applied research, that undertaken with a specific commercial objective. The bulk of R & D spending goes for development, i.e., technical activities concerned with translating knowledge into products or processes, but does not include product testing, marketing research, and other activities downstream from the laboratory.

The five largest industrial categories of national R & D, accounting for 78 percent of the 1979 total, are: aircraft and missiles, $8,454 million; electrical equipment and electronics, $7,646 million, machinery, $5,126 million; motor vehicles, $4,429 million; and chemicals (including pharmaceuticals), $4,035 million. The division of R & D by industry is not available for states. Patent statistics, which can be analyzed on a state-by-state basis, show that during 1980 ten companies were granted twenty or more patents with a Michigan origin.

Company	Number of patents	
	Michigan	United States
General Motors	188	326
Upjohn	148	170
Dow	144	259
Ford Motor	133	145
BASF	47	56
Bendix	43	131
Eaton	42	104
Dow Corning	26	31
Chrysler	23	25
Ethyl	23	50

These companies accounted for 817 or 38 percent of the 2,167 patents granted in Michigan and 63 percent of the U.S. patents granted to those companies. These figures, along with tabulations of patents classified on a product basis, suggest that 25–30 percent of the patents granted in Michigan are related to motor vehicles, 20–25 percent to pharmaceuticals and other chemicals, and 15–20 percent to machinery, including materials handling equipment. Michigan is weak in R & D in the fields of aircraft, electronics, petroleum, rubber, textiles, apparel, food, tobacco, and stone, clay, and glass products.

In total patents Michigan had 5.5 percent of the national total during 1979 a figure well below our nine and one-half percent of R & D. On the theory that research is more likely to have a patentable result than is development, this difference suggests that emphasis on development is even more pronounced here than nationally. Michigan's greater concentration on development also is borne out in recently released employment figures for the high-technology occupations. In 1980, the date of the latest Census of Population, 4.4 percent of the nations engineers and 4.0 percent of the nation's engineering and science technicians were employed in Michigan, compared with only 3 percent of the computer specialists and 2.9 percent of the scientists. That these proportions of engineering and science personnel are well below our proportion of R & D points to another Michigan phenomenon: a very high volume of R & D activity per person so employed, suggesting a high concentration of R & D among relatively few companies.

In summary, Michigan R & D is concentrated in the broad categories of metals technology and chemicals, focuses heavily on development as opposed to research, and is dominated by big, not small, business.

TABLE 1: Research and Development and Patent Activity in Michigan: 1963–1981

Year	Research and development spending				Patents	
	Federal funds		Company funds			
	($000,000)	percentage	($000,000)	percentage	number	percentage
1963	65	.9	797	14.9	2,347	6.3
1964	65	.9	835	14.5	2,433	6.3
1965	64	.8	895	14.6	3,135	6.2
1966	98	1.2	977	13.5	3,675	6.4
1967	115	1.4	952	11.9	3,306	6.1
1968	98	1.1	1,086	12.2	2,968	6.1
1969	83	1.0	1,228	12.5	3,160	5.9
1970	77	1.0	1,171	11.6	2,831	5.7
1971	78	1.0	1,338	12.6	3,386	5.8
1972	86	1.1	1,500	13.2	3,156	5.8
1973	56	.7	1,832	14.4	3,091	5.7
1974	78	.9	1,990	14.2	3,215	5.6
1975	114	1.3	1,858	12.6	2,832	5.7
1976	124	1.3	2,248	12.9	2,961	5.2
1977	144	1.4	2,614	13.5	2,474	5.2
1978	n.a.	n.a.	n.a.	n.a.	2,373	5.3
1979	150	1.2	3,439	13.5	1,875	5.5
1980	n.a.	n.a.	n.a.	n.a.	2,130	5.6
1981	n.a.	n.a.	n.a.	n.a.	2,457	5.7

SOURCE: Developed from National Science Foundation and Commissioner of Patents and Trademarks data.
n.a.: not available.

TABLE 2: Michigan Experienced Labor Force in High-Technology Occupations: 1970 and 1980

Occupation	Number		Percentage of U.S.	
	1970	1980	1970	1980
Engineers	55,089	65,048	4.4	4.4
Engineering and science technicians	39,309	45,670	4.7	4.0
Computer specialists	9,463	17,748	3.6	3.0
Scientists	6,908	9,061	3.3	2.9
Mathematicians	1,010	1,304	2.8	n.a.

SOURCE: Developed from Census of Population and Current Population Survey.
n.a.: not available.

THE MICHIGAN ECONOMY
Bureau of Business Research
School of Business Administration
Wayne State University
Detroit, Michigan 48202
Address Correction Requested

NON-PROFIT ORG.
U. S. POSTAGE
PAID
Detroit, Mich.
Permit No. 3844

CONG INFO SERV
4520 EAST WEST HWY
BETHESDA MD
20814

Quarterly Personal Income in Michigan

	Millions of dollars, annual rates, seasonally adjusted							Percentage change 82(2) to 82(3)	
	1981				1982				
	1	2	3	4	1	2	3	Michigan	United States
TOTAL LABOR AND PROPRIETORS INCOME BY PLACE OF WORK									
BY TYPE									
Wage and salary disbursements	59,988	61,364	61,856	60,274	60,380	61,853	61,830	—	+8.5
Other labor income	7,523	7,800	7,938	7,765	7,951	8,355	8,373	+ .2	+2.0
Proprietors income	4,360	4,362	4,395	4,299	4,108	4,142	4,218	+ 1.8	+ .8
Farm	423	445	537	489	353	354	330	− 6.7	−4.8
Nonfarm	3,937	3,917	3,858	3,810	3,755	3,788	3,889	+ 2.7	+1.8
BY INDUSTRY									
Farm	680	699	788	740	610	619	603	− 2.6	−2.0
Nonfarm	71,192	72,828	73,401	71,598	71,829	73,730	73,818	+ .1	+1.0
Private	61,575	63,170	63,699	61,803	62,086	63,732	63,718	—	+ .9
Ag. Serv., For., Fish., and other	171	169	169	170	166	162	162	—	+2.8
Mining	363	396	433	413	424	344	337	− 2.0	−4.4
Construction	3,121	3,114	2,994	2,938	2,809	2,633	2,793	+ 6.1	− .4
Manufacturing	29,431	30,355	30,596	28,693	28,964	30,568	29,931	− 2.1	− .3
Nondurable goods	4,679	4,865	4,857	4,680	4,833	5,002	4,993	− .2	+ .4
Durable goods	24,753	25,490	25,739	24,013	24,132	25,566	24,938	− 2.4	− .7
Transportation and public utilities	4,056	4,197	4,270	4,192	4,265	4,272	4,226	− 1.1	+ .4
Wholesale trade	3,778	3,861	3,944	4,006	3,952	3,906	3,934	+ .7	+ .8
Retail trade	6,299	6,391	6,514	6,380	6,293	6,326	6,483	+ 2.5	+1.4
Finance, insurance, and real estate	2,861	2,966	2,993	3,035	3,060	3,118	3,204	+ 2.8	+3.2
Services	11,495	11,722	11,787	11,976	12,151	12,402	12,648	+ 2.0	+2.8
Government and government enterprise	9,617	9,658	9,702	9,795	9,743	9,998	10,100	+ 1.0	+1.3
Federal, civilian	1,215	1,214	1,238	1,264	1,240	1,283	1,310	+ 2.1	+1.7
Federal, military	226	229	236	268	264	267	272	+ 1.9	+ .2
State and local	8,176	8,215	8,227	8,264	8,239	8,449	8,518	+ .8	+1.3
DERIVATION OF PERSONAL INCOME BY PLACE OF RESIDENCE									
Total labor and proprietors income by place of work	71,871	73,527	74,189	72,338	72,439	74,349	74,421	+ .1	+ .9
Less: Personal contributions for social insurance by place of work	3,828	3,910	3,921	3,794	3,915	4,001	3,998	− .1	+ .9
Net labor and proprietors income by place of work	68,043	69,617	70,268	68,544	68,524	70,349	70,423	+ .1	+ .9
Plus: Residence adjustment	468	467	475	476	472	472	477	+ 1.0	+1.0
Net labor and proprietors income by place of residence	68,511	70,084	70,744	69,020	68,996	70,821	70,900	+ .1	+ .9
Plus: Dividends, interest, and rent	14,384	15,112	15,964	16,461	16,826	17,320	17,761	+ 2.5	+2.4
Plus: Transfer payments	13,970	14,030	14,305	14,673	14,727	15,555	15,686	+ .8	+4.2
State U.I. benefits	1,071	1,251	1,058	1,472	1,445	2,027	1,634	−19.4	+8.0
Transfers excluding state U.I.	12,899	12,779	13,247	13,201	13,282	13,526	14,052	+ 3.9	+4.0
Personal income by place of residence	96,864	99,225	101,012	100,154	100,549	103,697	104,347	+ 3.1	+1.7

SOURCE: Bureau of Economic Analysis, special release.

BEST AVAILABLE COPY

8/31/83 U9660-2 A

THE MICHIGAN ECONOMY

Volume 2 No. 4
MAY-JUNE 1983

Published by the
Bureau of Business Research
School of Business
Administration
The Prentis Building

Wayne State University

DETROIT, MICHIGAN 48202

Published bimonthly. Third class postage paid at Detroit, Michigan.

ISSN 0738-7725

County Income Patterns

by DAVID I. VERWAY, *Director, Bureau of Business Research, School of Business Administration, Wayne State University*

The earnings growth comparisons of Michigan counties are based on data recently released by the Bureau of Economic Analysis. BEA county earnings estimates are developed from reports that employers file with state employment agencies and from tax returns filed with the Internal Revenue Service. Total earnings are comprised of labor income and the net incomes of nonincorporated business enterprises—proprietary motels, restaurants, and grocery stores—as well as the businesses of professionals, such as physicians, dentists, lawyers, and trade contractors. These data are the best available yardsticks of economic activity taking place in counties, although they are not as comprehensive as gross national product accounts for the United States. Michigan counties are ranked in Table 1 on the basis of earnings growth rates between 1980 and 1981.

Ontonagon led Michigan counties in earnings growth between 1980 and 1981. An increase in copper extraction at the White Pine Mine provided the major stimulus. To the north in the city of Ontonagon, the Upper Peninsula Shipbuilding Company (UPSCO) was adding to its labor force so it could fulfill its contract with the State of Michigan. UPSCO was formed in the late 1970s in order to build barges to carry freight across Lake Michigan. The new vessels are intended to replace car ferries being retired by the railroads. In the wake of payroll gains at White Pine and UPSCO and the third major employer, Hoerner Waldorf, a paper company, local transportation companies, retailers, and providers of services enjoyed their best year since 1975. White Pine experienced substantial reductions in the mid-1970s following management's decision to stop losing money as a supplier to the automotive industry.

Natural resources also were responsible for outsize earnings gains in two northern Lower Peninsula counties. In addition to two natural gas purification plants, Kalkaska has a growing oil and gas drilling and producing industry which has made it Michigan's county with the fastest growing economy during the past decade. Isabella county is home to a number of companies that service the oil and gas industry. It too has enjoyed economic growth well above state and national averages. Both counties host small but growing durable goods pro-

NOW AVAILABLE

Michigan Statistical Abstract, 1982–83, 17th edition

Statistics in the accompanying article were drawn from this edition of the *ABSTRACT*. In all, there are 45 tables in this *ABSTRACT* based on the county income figures compiled by the Bureau of Economic Analysis. Other growth comparisons can be developed from Michigan Employment Security Commission figures, also available in the *ABSTRACT*.

Published by
Bureau of Business Research
School of Business Administration
Wayne State University

See order form on page 7. 697 pages, $15.50

BEST AVAILABLE COPY

TABLE 1
Ranking of Michigan Counties According to Growth in Labor and Proprietors' Earnings by County in Which Earned: 1980–81

County	% change 1971–81	% change 1980–81	County	% change 1971–81	% change 1980–81
Ontonagon	90	24	Berrien	98	6
Kalkaska	642	23	Oakland	192	6
Monroe	167	18	Benzie	137	6
Isabella	202	18	Leelanau	110	6
Osceola	151	13	Calhoun	117	6
Hillsdale	136	13	St. Joseph	136	6
Genesee	142	13	Ogemaw	200	6
Delta	157	13	Livingston	208	6
Mackinac	150	13	Branch	143	6
St. Clair	141	12	Muskegon	130	5
Chippewa	60	11	Lapeer	145	5
Ingham	163	11	Eaton	146	5
Presque Isle	143	11	Alcona	135	5
Bay	130	11	Mason	88	5
Iron	138	11	Emmet	142	5
Montcalm	146	10	Sanilac	103	5
Menominee	164	10	Lenawee	95	5
Marquette	178	10	Schoolcraft	145	4
Allegan	158	9	Manistee	135	4
Clinton	167	9	Oscoda	114	4
Ionia	164	9	Alger	128	4
Wexford	180	9	Shiawassee	103	3
Kent	168	8	Gratiot	136	3
Keweenaw	4	8	Gladwin	160	3
Saginaw	132	8	Wayne	88	3
Kalamazoo	163	8	Macomb	128	3
Ottawa	188	8	Luce	157	2
Clare	147	8	Alpena	127	2
Newaygo	112	8	Tuscola	153	2
Otsego	274	8	Huron	140	1
Crawford	179	8	Lake	52	1
Van Buren	139	8	Barry	126	1
Midland	155	7	Cheboygan	149	1
Iosco	94	7	Gogebic	88	0
Grand Traverse	219	7	Oceana	146	0
Cass	133	7	Baraga	102	−1
Washtenaw	192	7	Antrim	143	−1
Jackson	125	7	Mecosta	166	−1
Missaukee	163	7	Dickinson	159	−2
Roscommon	175	6	Montmorency	82	−6
Charlevoix	178	6			
Arenac	159	6	Michigan	129	6
Houghton	141	6	United States	157	10

SOURCE: Bureau of Economic Analysis, Regional Economics Information System.

ducing sectors as well. Construction, retailing, and services have benefited from growth in oil and gas activity and manufacturing.

Detroit Edison was responsible for putting Monroe and St. Clair counties among Michigan's top ten in earnings growth between 1980 and 1981. In Monroe County, Edison was installing pollution controls at its coal-fired electric generating plant. Edison also accelerated construction of Fermi Two, a nuclear generating plant. In St. Clair County, construction work at the Bells River coal-fired generating plant was responsible for relatively high earnings growth.

Osceola County has growing nursing home and personal health care industries that draw retirees from further south. In addition, cutbacks at Traverse City Regional Psychiatric Hospital have caused an influx of patients seeking half-way house care in Osceola County.

Hillsdale and Genesee counties, sixth and seventh in earnings growth between 1980 and 1981, benefited from the modest 1981 improvement in vehicle production in this state. Hillsdale has a number of supplier factories, and Genesee is home to the Buick Motor Car Division. There are other large General Motors factories in Flint. GM payrolls account for well over half the earnings in Genesee County, the county most dependent on durable goods manufacturing in the state.

The other two counties in the top ten growth listing for Michigan are Delta and Mackinac. In the former, Mead Paper Company increased production at its newly expended plant in Escanaba. Mackinac County was buoyed by increased construction activity plus recovery in tourism, the backbone of that small economy.

At the other extreme, Montmorency became Michigan's most depressed county when an automotive supplier shifted its operations to Mexico. In Dickinson County, Michigan's last underground iron ore mine was closed due to high costs and depressed markets. Factory closings affected Mecosta and Antrim counties. Manufacturing activity was weak in Baraga, Oceana, and Gogebic counties. Mecosta, Antrim, and Oceana experienced declining agricultural earnings. Construction activity declined sharply in Mecosta, Antrim, and Baraga counties. It should be borne in mind that none of the declining economies is sizeable; relatively small numerical changes underlay those percentages.

Generally speaking, Michigan's rural counties are dependent on urban counties as markets either for goods or for tourism and outdoor recreation. Since they do have these narrow specialties, they are more volatile than their more diversified urban markets.

Over the long term, the counties which grew more rapidly than the national average are the least populous. Exceptions are Oakland, Washtenaw, Kent, and Ingham. Oakland has developed an office/service base to complement the manufacturing economies of Wayne and Macomb. Washtenaw has a high-technology emphasis. Kent is the home of several rapidly growing office furniture companies as well as being the financial and commercial capital of Western Michigan. Ingham hosts the state government, Michigan State University, and Oldsmobile.

With the exception of Oakland, Washtenaw, and Ottawa, counties that grew exceptionally rapidly (175 percent or more earnings gain between 1971 and 1981) are located in Northern Michigan.

Tables 2 and 3 focus on the counties where the various broadly defined kinds of economic activity are most and least prominent. GM is the major anchor in Genesee and Saginaw, whereas the chemical industry dominates Midland (Dow Chemical and Dow Corning). The economic health of St. Joseph County depends on its automotive suppliers. Macomb County also is heavily automotive. Ottawa County has a sizeable proportion of the

TABLE 2

Michigan Counties Most and Least Dependent on Manufacturing; Selected Services; Retail Trade; and Transportation, Communication and Public Utilities (TPCU) in Their Economic Base: 1981

Manufacturing			Selected Services			Retail Trade			TCPU		
County	Dependency[a]	Growth 1980–81[b]	County	Dependency[a]	Growth 1980–81[b]	County	Dependency[a]	Growth 1980–81[b]	County	Dependency[a]	Growth 1980–81[b]
Ten Most Dependent											
Genesee	58.49	19	Emmet	35.48	12	Keweenaw	23.05	44	St. Clair	14.23	0.05
Midland	55.02	2	Crawford	31.10	15	Clare	22.17	9	Shiawassee	11.22	0.007
Saginaw	50.95	13	Leelanau	29.09	11	Roscommon	20.53	12	Chippewa	10.50	0.06
St. Joseph	50.89	4	Oakland	24.55	12	Cheboygan	20.04	13	Mason	9.81	0.03
Macomb	49.88	3	Grd. Traverse	22.89	10	Montmorency	19.62	2	Dickinson	9.46	0.02
Ottawa	48.73	13	Keweenaw	21.85	5	Lake	18.87	3	Alpena	9.38	−0.05
Manistee	48.69	5	Gogebic	21.75	15	Ogemaw	18.63	4	Delta	8.98	0.04
Lenawee	48.07	6	Clare	19.70	6	Missaukee	18.35	10	Tuscola	7.88	0.06
Muskegon	47.37	8	Mackinac	19.32	6	Alcona	18.34	8	Ogemaw	7.83	0.03
Allegan	46.86	17	Wexford	18.77	9	Arenac	18.28	6	Schoolcraft	7.59	0.09
Five Least Dependent											
Marquette	2.91	0	Kalkaska	6.02	26	Midland	5.07	7	Ontonagon	1.46	0.001
Luce	2.94	−17	Menominee	7.41	17	Ontonagon	5.67	11	Osceola	1.62	0.08
Lake	3.22	4	St. Joseph	7.65	18	Washtenaw	6.34	4	Leelanau	1.92	0.01
Presque Isle	3.38	38	Branch	7.65	7	Genesee	6.92	−4	Montcalm	2.09	−0.02
Mackinac	4.08	9	Ionia	8.38	5	Ingham	7.02	3	Clinton	2.21	0.08
Michigan	40.41	8	Michigan	16.15	9	Michigan	8.77	4	Michigan	5.76	0.06
United States	25.67	9	United States	18.10	13	United States	9.42	8	United States	7.75	0.09

SOURCE: Bureau of Economic Analysis, Regional Economics Information System.
a. Earnings in this sector as a percentage of total labor and proprietors' earnings.
b. Percentage change in labor and proprietors' earnings in this sector.

TABLE 3

Michigan Counties Most and Least Dependent on Wholesale Trade; Construction; Finance, Insurance, and Real Estate; and Agriculture in Their Economic Base: 1981

Wholesale Trade			Construction			Finance, Insurance and Real Estate			Agriculture		
County	Dependency[a]	Growth 1980–81[b]	County	Dependency[a]	Growth 1980–81[b]	County	Dependency[a]	Growth 1980–81[b]	County	Dependency[a]	Growth 1980–81[b]
Ten Most Dependent											
Oakland	8.79	3	Montmorency	16.28	−6	Eaton	8.90	6	Missaukee	23.95	4
Dickinson	8.72	−2	Monroe	16.07	(D)	Livingston	7.36	9	Sanilac	19.61	−3
Tuscola	8.64	3	Kalkaska	15.96	6	Montmorency	7.29	5	Huron	18.53	−18
Kent	8.33	8	Midland	15.73	30	Lake	7.26	−1	Oceana	15.32	−3
Branch	7.17	0	Alcona	14.58	−2	Calhoun	6.20	7	Tuscola	15.22	−13
Huron	6.84	10	St. Clair	11.32	62	Oakland	6.15	2	Gratiot	13.56	−5
Genesee	6.34	15	Cheboygan	10.70	1	Misaukee	5.64	8	Arenac	12.94	−8
Bay	5.81	10	Mackinac	10.25	30	Gladwin	5.59	9	Clinton	11.81	3
Menominee	5.77	−5	Iron	10.24	6	Grand Traverse	5.42	11	Cass	11.65	2
Wayne	5.75	4	Leelanau	9.78	5	Roscommon	5.22	2	Leelanau	9.00	−22
Five Least Dependent											
Ontonagon	0.56	(D)	Luce	1.77	−2	Allegan	1.37	3	Keweenaw	0.00	x
Midland	0.65	−9	Ontonagon	1.96	33	Alcona	1.43	(D)	Crawford	0.00	x
Schoolcraft	0.90	13	Branch	2.15	−29	Luce	1.43	3	Wayne	0.02	−8
Alger	1.14	14	Lenawee	2.38	−3	Midland	1.50	9	Oakland	0.05	−17
Baraga	1.18	(D)	Washtenaw	2.45	−8	Ontonagon	1.77	13	Roscommon	0.13	−3
Michigan	5.36	6	Michigan	4.17	−2	Michigan	4.08	4	Michigan	1.00	−2
United States	6.87	10	United States	5.61	4	United States	5.84	10	United States	1.99	19

SOURCE: Bureau of Economic Analysis, Regional Economics Information System.
a. Earnings in this sector as a percentage of total labor and proprietors' earnings.
b. Percentage change in labor and proprietors' earnings in this sector.
(D). Withheld to avoid disclosing data for individual companies.
x. Earnings not reported.

THE MICHIGAN ECONOMY

Bureau of Business Research
School of Business Administration
Wayne State University

FRED P. UNRUH
Acting Dean
School of Business Administration

DAVID I. VERWAY
Director
Bureau of Business Research

DOREEN BRODER
Editor

GAIL GUIP
Secretary

DAVID L. WILLIAMS
Research Associate

SAFIUL HUDA
PARESH SHAH
Graduate Assistants

REVATHI BALASUBRAMANIAN
Student Assistant

Michigan Economic Indicators

Item	Year previous of latest month	Previous month	Latest month
Manufacturing workers:			
Average weekly hours, Michigan	40.4	41.8	42.4 (Apr.)
Average weekly hours, U.S.	38.7	39.6	39.8 (Apr.)
Average hourly earnings, Michigan ($)	11.12	11.41	11.53 (Apr.)
Average hourly earnings, U.S. ($)	8.42	8.74	8.77 (Apr.)
U.S. motor vehicle production (units)	674,856	796,232	722,836 (Mar.)
Electricity usage (mil. kwh.):			
Michigan	5,415	5,683	5,319 (Feb.)
United States	182,805	179,122	173,596 (Feb.)
Raw steel production:			
Michigan (000 net tons)	592	675	656 (Apr.)
United States (000 net tons)	6,982	7,127	7,292 (Apr.)
Consumer price index (1967 = 100)			
Detroit area	283.7	292.4	294.9 (Apr.)
United States	284.3	293.4	295.5 (Apr.)
U.S. producer price index (1967 = 100)	298.0	300.5	300.8 (Apr.)
Michigan farm prices received index (1977 = 100)	139	119	122 (Apr.)

SOURCE: U.S. Bureau of the Census; U.S. Bureau of Labor Statistics; Michigan Crop Reporting Service; Ward's Automotive Reports; American Iron and Steel Institute; and Energy Information Administration.

Contracts for Future Building, First 4 Months: 1982 and 1983

(Thousands of Dollars)

Area	Nonresidential			Residential			Total[a]		
	1982	1983	Percentage change	1982	1983	Percentage change	1982	1983	Percentage change
Ann Arbor	28,648	16,399	− 43	5,362	7,737	+ 44	34,010	24,136	− 29
Battle Creek	12,594	2,507	− 80	2,585	4,578	+ 77	15,179	7,085	− 53
Bay City	4,600	7,475	+ 63	1,114	3,146	+182	5,714	10,621	+ 86
Detroit	119,082	128,958	+ 8	58,711	134,351	+129	177,793	263,309	+ 48
Flint	7,107	7,519	+ 6	8,569	6,577	− 23	15,676	14,096	− 10
Grand Rapids	18,443	24,922	+ 35	17,663	43,192	+145	36,106	68,114	+ 89
Jackson	3,086	1,657	− 46	2,265	5,083	+124	5,351	6,740	+ 26
Kalamazoo-Portage	104,001	3,799	− 96	9,508	12,400	+ 30	113,509	16,199	− 86
Lansing-East Lansing	6,055	14,156	+134	8,012	20,088	+151	14,067	34,244	+143
Muskegon-Norton Shores-Muskegon Heights	528	2,987	+466	3,463	7,241	+109	3,991	10,228	+156
Saginaw	1,808	2,594	+ 43	2,117	4,023	+ 90	3,925	6,617	+ 69
Toledo	41,539	32,778	− 21	13,881	30,750	+122	55,420	63,528	+ 15
Michigan	321,873	254,573	− 21	172,473	354,166	+105	494,346	608,739	+ 23

SOURCE: F. W. Dodge Division of McGraw-Hill Information Systems Company, news releases.

Note: Battle Creek includes Barry and Calhoun counties; Detroit includes Lapeer, Livingston, Macomb, Oakland, St. Clair, and Wayne counties; Flint includes Genesee and Shiawassee counties; Grand Rapids includes Kent and Ottawa counties; Kalamazoo-Portage includes Kalamazoo and Van Buren counties; Lansing-East Lansing includes Clinton, Eaton, Ingham, and Ionia counties; Muskegon-Norton Shores-Muskegon Heights includes Muskegon and Oceana counties; and Toledo includes Monroe County, Michigan, and Fulton, Lucas, Ottawa, and Wood counties, Ohio.

a. Excludes nonbuilding construction contracts. This category comprises streets and highways, bridges, dams, reservoirs, river and harbor developments, sewerage and water supply systems, missile and space flight facilities, airports, utilities, and communication systems. For Michigan the 1982 and 1983 figures for nonbuilding construction contracts were $162,953,000 and $174,807,000 respectively or an increase of 7 percent. Total building and nonbuilding construction contracts increased by 19 percent in Michigan.

office furniture industry of the Grand Rapids area. Surprising to some perhaps, Wayne County does not appear among the most heavily manufacturing dependent. Reflecting the closure of or decline in so many of its factories, Wayne ranked fourteenth in the importance of manufacturing to county makeup.

The importance of tourism and outdoor recreation in Northern Michigan is reflected in county rankings according to selected services and retail trade. The only southern Michigan county in these rankings, Oakland, has a service sector heavily dominated by professional and business services, not tourism. Oakland is at the top of the list of counties where wholesale trade is most prominent, another indication of its satellite relationship to Wayne and Macomb counties.

The Thumb Area and Missaukee, Oceana, and Gratiot counties are heavily influenced by events in the markets for navy beans, cherries, apples, asparagus, and cucumbers. With recently depressed farm earnings, these regions have been affected accordingly.

RESIDENCE ADJUSTMENT

The numbers in Tables 1 through 3 focus on economic activity taking place within counties, regardless of where the wage earners live. To calculate income received by persons within a county, the BEA has developed residents adjustments. For example, in 1981 residents of other counties earned $28,784,000 more in Ontonagon than Ontonagon residents earned elsewhere (see Table 4). That figure constitutes more than 4 percent of total earnings generated in the county. Other counties exporting a large percentage of earnings or, correlatively, importing a large percentage of labor are Ingham, Washtenaw, and Midland. Although Wayne ranks fifth in the proportion of earnings going to outside residents, it has by far the largest sheer dollar volume.

In dollar volume of earnings imported or labor exported, Oakland is first and Macomb second, although in percentage ranking they are 39 and 24 respectively. These figures merely illustrate what is common knowledge—the dependence of Oakland and Macomb residents on Wayne County jobs is not inconsequential. In a relative sense, the greatest such dependence in this state is Eaton's reliance on Ingham.

PROPERTY INCOME AND TRANSFER PAYMENTS

Total personal income is the sum of earnings received and income that entails no labor in return. The latter has two components: property income and transfer payments. Property income is received as dividends, interest, and rent by owners of capital. Transfer payments include Social Security and other pensions, welfare benefits, unemployment compensation, and other income not linked to current production or to capital ownership. Except for Huron, Keweenaw, and Mackinac, twenty Michigan counties that outrank the others in percentage of personal income derived from property ownership are all located in the northern Lower Peninsula (see Table 5). It is to these counties that many workers retire when they leave Genesee, Wayne, Macomb, and the other industrial centers.

TABLE 4
Earnings Residence Adjustment of Michigan Counties: 1981

County	(Dollar figures in thousands) Labor and proprietors' earnings by county in which earned	Residence adjustment	Labor and proprietors' earnings by county in which received	Proportion[a]
Bottom Ten				
Eaton	212,982	422,940	635,922	0.6651
Clinton	148,376	266,581	414,957	0.6424
Livingston	289,349	442,865	732,214	0.6048
Leelanau	32,407	33,291	65,698	0.5067
Lapeer	229,245	220,637	449,882	0.4904
Keweenaw	3,208	3,060	6,268	0.4882
Cass	163,810	151,654	315,464	0.4807
Shiawassee	256,153	223,628	479,781	0.4661
Monroe	557,195	457,125	1,014,320	0.4507
Barry	140,786	113,562	254,348	0.4465
Top Ten				
Otsego	91,514	−9,262	82,252	−0.1012
Genesee	4,190,571	−466,556	3,724,015	−0.1113
Wexford	134,795	−15,118	119,677	−0.1122
Grand Traverse	411,989	−49,243	362,746	−0.1195
Kent	3,864,741	−465,865	3,398,876	−0.1205
Wayne	21,306,995	−3,007,848	18,299,147	−0.1412
Midland	686,693	−111,530	575,163	−0.1624
Washtenaw	2,835,392	−635,540	2,199,852	−0.2241
Ingham	3,122,133	−897,921	2,224,212	−0.2876
Ontonagon	68,941	−28,784	40,157	−0.4175
Michigan	68,820,300	471,756	69,292,056	0.0068
United States	1,645,325,008	−484,000	1,644,841,008	−0.0003

SOURCE: Bureau of Economic Analysis, Regional Economics Information System.
a. Residence adjustment as a percentage of labor and proprietors' earnings received (where positive) or generated (where negative).

During 1978, Social Security (federal, old age, survivors, and disability insurance) payments in Michigan accounted for 41 percent of total transfer payments; welfare, 15 percent; Medicare, 14 percent; military retirement and veterans' benefits, 4 percent; unemployment benefits, 11 percent; and other items, 15 percent. Lake County is more heavily dependent on transfer payments than any other Michigan county (see Table 6). It ranks first in welfare benefits as a percentage of personal income (6 percent), and fourth in Social Security benefits as a percenatge of personal income (19 percent). The rankings in Table 6 primarily reflect Social Security benefits, because they are the major component of transfer payments. Northern Michigan counties rank high in this table for the same reason that they are located at the top of the list in Table 5.

PERSONAL INCOME

The sum of earnings received, property income, and transfer payments is a broad yardstick of the income available to individuals. Per capita personal income indicates how counties fare on the average in the acqusition of slices of national "pie." Oakland County does exceptionally well in this regard because it has high-paying industry and because well-paid workers with jobs elsewhere reside there (see Table 7). Michigan's other coun-

TABLE 5

Michigan Counties Most and Least Dependent on Property Income in Total Personal Income: 1981

County	Percentage	Per capita
Top Twenty		
Roscommon	31.1	$2,334
Montmorency	30.8	2,299
Leelanau	30.5	2,642
Alcona	27.8	1,959
Antrim	27.3	2,253
Oscoda	26.8	1,395
Emmet	26.0	2,367
Huron	25.3	2,369
Benzie	24.8	1,916
Crawford	24.4	1,659
Sanilac	22.9	1,889
Keweenaw	22.7	1,733
Ogemaw	22.1	1,491
Missaukee	21.8	1,376
Grand Traverse	21.3	2,164
Lake	21.2	1,391
Houghton	21.0	1,533
Cheboygan	20.9	1,613
Mackinac	20.7	1,770
Presque Isle	20.6	1,574
Bottom Twenty		
Van Buren	15.3	$1,296
Jackson	15.1	1,476
Isabella	15.1	1,157
Montcalm	14.9	1,297
Ionia	14.9	1,168
Eaton	14.8	1,426
Livingston	14.8	1,400
Calhoun	14.6	1,528
Saginaw	14.3	1,501
Clinton	14.2	1,400
Macomb	14.1	1,615
Shiawassee	14.0	1,343
Muskegon	14.0	1,279
Ingham	13.8	1,532
Lapeer	13.6	1,214
Wayne	13.3	1,533
Monroe	13.2	1,345
Marquette	13.2	1,156
Luce	13.2	1,272
Genesee	12.6	1,427
Michigan	15.6	1,682
United States	17.7	1,855

SOURCE: Bureau of Economic Analysis, Regional Economics Information System.

TABLE 6

Michigan Counties Most and Least Dependent on Transfer Payments in Total Personal Income: 1981

County	Per capita	Percentage
Top Twenty		
Lake	$2,462	37.5
Montmorency	2,712	36.3
Keweenaw	2,768	36.2
Oscoda	1,892	35.8
Alcona	2,465	35.0
Roscommon	2,593	34.6
Ogemaw	2,000	29.6
Iron	2,503	29.1
Clare	2,027	29.0
Gogebic	2,326	29.0
Ontonagon	1,936	27.1
Chippewa	2,040	27.0
Baraga	2,020	26.8
Gladwin	1,887	26.8
Alger	1,854	26.6
Schoolcraft	2,183	26.5
Houghton	1,913	26.2
Arenac	1,881	26.1
Crawford	1,761	25.9
Cheboygan	1,947	25.3
Bottom Twenty		
Barry	$1,165	14.7
Saginaw	1,533	14.6
Lapeer	1,292	14.5
Allegan	1,175	14.3
Bay	1,437	14.3
Jackson	1,394	14.3
Cass	1,299	14.2
Genesee	1,553	13.8
Ingham	1,431	12.9
Kent	1,335	12.6
Monroe	1,253	12.3
Kalamazoo	1,306	12.0
Washtenaw	1,268	11.1
Ottawa	1,053	10.9
Clinton	1,070	10.9
Macomb	1,226	10.7
Eaton	1,033	10.7
Midland	1,060	9.9
Livingston	909	9.6
Oakland	1,305	9.2
Michigan	1,548	14.4
United States	1,467	14.0

SOURCE: Bureau of Economic Analysis, Regional Economics Information System.

ties with heavy dependence on manufacturing also rank high in per capita income because the majority of those jobs are high paying.

Most northern Michigan counties in the Lower Peninsula have low per capita incomes because a high proportion of their residents are retirees living on accumulated wealth and pensions. Also, the retail and service industries that cater to them and to summer visitors offer low-paying jobs for the most part. The area provides summer employment for high school and college students as well as for older workers who live there. A survey of the economic attitudes of residents would likely find that those in Roscommon, Benzie, Antrim, Leelanau, and Emmet counties consider themselves well off, even though their per capita incomes are well below Michigan and national averages. In contrast, according to the most recent Census of Population (1980, based on 1979 incomes), the incidence of poverty among permanent residents was a ratio of 1:7 or more in Oscoda, Missaukee, Lake, Ogemaw, Clare, Alcona, Gladwin, Arenac, Kalkaska, Montmorency, Chippewa, Presque Isle, and Cheboygan. Among metropolitan counties, Wayne was the only one experiencing poverty at that level.

TABLE 7
Ranking of Michigan Counties According to Per Capita Personal Income: 1981

County	Per capita personal income	Percentage change 1980–81	County	Per capita personal income	Percentage change 1980–81	County	Per capita personal income	Percentage change 1980–81
Oakland	$14,126	8.7	Emmet	$9,099	8.3	Isabella	$7,687	17.5
Wayne	11,486	7.2	Tuscola	9,007	7.8	Keweenaw	7,657	11.9
Washtenaw	11,462	8.8	Lapeer	8,892	9.5	Presque Isle	7,646	14.7
Macomb	11,430	4.4	St. Joseph	8,869	7.5	Baraga	7,568	8.1
Genesee	11,296	11.5	Branch	8,844	8.1	Chippewa	7,562	16.4
Ingham	11,062	11.3	Marquette	8,752	11.0	Roscommon	7,514	10.3
Kalamazoo	10,852	9.4	Otsego	8,723	9.5	Mason	7,505	7.5
Midland	10,750	10.3	Montcalm	8,686	9.8	Montmorency	7,500	9.7
Kent	10,586	9.9	Leelanau	8,660	9.2	Kalkaska	7,369	18.1
Calhoun	10,497	9.5	Charlevoix	8,636	10.6	Houghton	7,301	11.6
Saginaw	10,485	9.7	Iron	8,601	11.0	Arenac	7,226	10.4
Monroe	10,163	12.6	Mackinac	8,507	14.9	Newaygo	7,206	10.7
Grand Traverse	10,160	9.7	Hillsdale	8,479	14.2	Oceana	7,170	8.0
Bay	10,048	11.6	Van Buren	8,462	10.5	Ontonagon	7,131	11.4
Clinton	9,850	7.7	Alpena	8,450	6.4	Gladwin	7,037	9.6
Dickinson	9,763	6.4	Manistee	8,369	11.3	Alcona	7,025	12.7
Jackson	9,758	10.5	Delta	8,357	12.6	Clare	6,998	9.7
Luce	9,698	11.5	Sanilac	8,237	11.0	Alger	6,934	12.3
Ottawa	9,655	8.9	Antrim	8,232	8.0	Osceola	6,873	10.4
Eaton	9,638	10.4	Schoolcraft	8,230	14.5	Crawford	6,798	12.0
Shiawassee	9,574	8.4	Allegan	8,205	10.8	Ogemaw	6,756	12.4
Lenawee	9,525	8.6	Menominee	8,060	10.3	Lake	6,529	13.1
Berrien	9,501	11.3	Gogebic	8,022	10.1	Missaukee	6,309	8.1
St. Clair	9,481	12.0	Iosco	7,968	10.9	Mecosta	5,929	4.7
Livingston	9,464	8.3	Barry	7,913	6.1	Oscoda	5,183	7.6
Huron	9,356	8.5	Ionia	7,837	8.7			
Cass	9,174	8.6	Wexford	7,768	9.6			
Gratiot	9,147	5.6	Benzie	7,740	11.5	Michigan	10,758	8.6
Muskegon	9,123	8.8	Cheboygan	7,717	8.0	United States	10,495	10.7

SOURCE: Bureau of Economic Analysis, Regional Economics Information System.

Michigan Statistical Abstract, 1982–83

The *ABSTRACT, Seventeenth Edition,* is a compilation of facts concerning the social and economic conditions of the state and its subdivisions. It includes the latest available information, including data from the 1980 census, on such topics as:

- population and housing
- the labor market
- governmental finance and employment
- energy production and consumption
- income and cost of living
- taxes and social welfare
- agriculture and mining
- wholesale and retail trade

and many other topics.

Order from: Bureau of Business Research, School of Business Administration, Wayne State University, Detroit, MI 48202

Please send _____ copy/ies of the *Michigan Statistical Abstract, 1982–83*

Name_____

Organization_____

Address_____

City_____ State_____ Zip_____

Please enclose $15.50 for each copy ordered.
Make checks payable to Wayne State University.

THE MICHIGAN ECONOMY
Bureau of Business Research
School of Business Administration
Wayne State University
Detroit, Michigan 48202
Address Correction Requested

NON-PROFIT ORG.
U. S. POSTAGE
PAID
Detroit, Mich.
Permit No. 3844

CHERYL WALDMAN
CONG INFO SERV
4520 EAST WEST HWY
BETHESDA MD
20814

Quarterly Personal Income in Michigan

	Millions of dollars, annual rates, seasonally adjusted								Percentage change 82(3) to 82(4)	
	1981				1982					
	1	2	3	4	1	2	3	4	Michigan	United States
TOTAL LABOR AND PROPRIETORS INCOME BY PLACE OF WORK										
BY TYPE										
Wage and salary disbursements	59,707	60,995	61,504	60,086	58,747	59,360	59,342	57,666	− 2.8	0.3
Other labor income	7,496	7,789	7,943	7,798	7,720	8,011	8,040	7,682	− 4.5	1.5
Proprietors' income	4,363	4,360	4,395	4,299	4,104	4,110	4,186	4,559	8.9	9.1
Farm	423	445	537	489	333	310	276	492	78.3	46.7
Nonfarm	3,940	3,915	3,857	3,810	3,772	3,800	3,910	4,067	4.0	3.2
BY INDUSTRY										
Farm	679	700	788	739	588	571	542	763	40.7	27.0
Nonfarm	70,887	72,444	73,054	71,444	69,984	70,910	71,026	69,145	− 2.6	0.5
Private	61,158	62,674	63,241	61,536	60,128	60,847	60,858	58,524	− 3.8	0.3
Ag. Serv., For., Fish., and other	170	168	168	172	172	172	177	185	4.5	4.6
Mining	379	412	450	429	403	331	326	316	− 3.1	− 4.1
Construction	3,146	3,104	2,982	2,901	2,829	2,600	2,763	2,882	4.3	1.3
Manufacturing	29,037	29,952	30,167	28,341	27,448	28,725	28,108	25,312	− 9.9	− 1.8
Nondurable goods	4,645	4,820	4,822	4,735	4,823	4,979	4,965	4,783	− 3.7	0.8
Durable goods	24,392	25,132	25,346	23,606	22,626	23,746	23,143	20,529	−11.3	− 3.4
Transportation and public utilities	4,060	4,192	4,264	4,239	4,254	4,149	4,100	4,074	− 0.6	0.6
Wholesale trade	3,805	3,890	3,969	3,912	3,851	3,772	3,799	3,792	− 0.2	− 0.3
Retail trade	6,278	6,354	6,480	6,390	6,246	6,128	6,290	6,324	0.5	0.3
Finance, insurance, and real estate	2,854	2,942	2,987	3,071	2,851	2,908	2,991	3,106	3.8	3.4
Services	11,429	11,660	11,773	12,081	12,074	12,062	12,305	12,533	1.8	2.0
Government and government enterprise	9,729	9,770	9,812	9,908	9,856	10,063	10,168	10,621	4.5	2.0
Federal, civilian	1,236	1,236	1,260	1,287	1,263	1,306	1,334	1,345	0.8	1.6
Federal, military	227	230	235	267	262	264	268	274	2.2	3.7
State and local	8,265	8,305	8,317	8,355	8,331	8,494	8,567	9,002	5.1	1.7
DERIVATION OF PERSONAL INCOME BY PLACE OF RESIDENCE										
Total labor and proprietors' income by place of work	71,566	73,143	73,842	72,183	70,572	71,481	71,568	69,908	− 2.3	0.9
Less: Personal contributions for social insurance by place of work	3,801	3,891	3,927	3,834	3,845	3,867	3,864	3,703	− 4.2	—
Net labor and proprietors' income by place of work	67,765	69,252	69,915	68,349	66,727	67,614	67,704	66,205	− 2.2	1.0
Plus: Residence adjustment	463	468	478	479	481	481	486	485	− 0.2	—
Net labor and proprietors' income by place of residence	68,228	69,720	70,392	68,827	67,209	68,095	68,190	66,689	− 2.2	0.4
Plus: Dividends, interest, and rent	14,386	15,114	15,963	16,458	16 809	17,287	17,560	17,580	0.1	—
Plus: Transfer payments	13,952	14,015	14,294	14,717	14,772	15,604	15,754	17,125	8.7	4.4
State U.I. benefits	1,069	1,244	1,041	1,497	1,471	2,063	1,673	2,627	57.0	25.7
Transfers excluding state U.I.	12,883	12,770	13,252	13,220	13,301	13,542	14,081	14,498	2.9	2.9
Personal income by place of residence	96,567	98,849	100,649	100,002	98,790	100,987	101,504	101,393	− 0.1	1.3

SOURCE: Bureau of Economic Analysis, special release.

10/25/83 U9660-2 A

THE MICHIGAN ECONOMY

Volume 2 No. 5
JULY-AUGUST 1983

Published by the
Bureau of Business Research
School of Business
Administration
The Prentis Building

Wayne
State
University

DETROIT,
MICHIGAN 48202

Published bimonthly. 2nd class
postage paid at Detroit, Michigan.

General Population Trends and Issues in Michigan

by CHING-LI WANG *and* LAURENCE S. ROSEN, *demographers, Legislative and Local Policy Division, Michigan Department of Management and Budget*

As the recession begins to diminish throughout the nation, and to some degree in Michigan as well, the process of gauging the impacts of the recession on current and future trends once again grows in importance. In Michigan it is particularly important for decision- and policymakers in both the private and public sectors to understand the changing demographic landscape, because growing signs of a strong economic recovery are not being accompanied by similarly strong signs relating to population growth throughout the state.

We last looked at the demographic trends in Michigan as revealed by preliminary counts from the 1980 Census of Population and Housing. Now, following two years in which we have been able to examine more extensive census data and have engaged in estimating postcensus population trends and predicting future population trends, the following comments constitute a more extensive and comprehensive follow-up to our previous article in *The Michigan State Economic Record*.

GROWTH TRENDS AND MIGRATION

As the nation more fully enters the so-called "postindustrial age" and manufacturing is becoming less important in the nation's economy, Michigan is in the process of a great transition. Although Michigan's population increased by 4.3 percent from 8,881,826 in 1970 to 9,262,078 in 1980, the rate was less than one-third the rate of growth experienced in Michigan between 1960 and 1970. Since 1980, population growth has declined even more due to the recession, and for the first time since World War II, Michigan experienced significant population decline to 9,227,000 in 1982. As a result, the proportion of the total U.S. population residing in Michigan has dropped from 4.37 percent in 1970 to 4.09 percent in 1980 and 3.99 percent in 1982. In effect, the momentum of population growth experienced for decades in Michigan has slowed considerably, and that portion of Michigan's growth coming from migration into the state has disappeared entirely as migration out of Michigan has exceeded migration into Michigan for more than a decade. During the 1970s, Michigan had a net loss of 300,000 residents to other states. In a little over two years following the 1980 census, net out-migration from Michigan is estimated to have reached 184,000.

Michigan has had a long history of gaining migrants from other states and from abroad. During the first half of the twentieth century, Michigan's population grew by 4 million, and more than half of the increase (55 percent) was due to migration into Michigan of mainly younger people looking for (and finding) work. In the late 1950s, due to saturation within the motor vehicle market and the general recession, the level of employment in Michigan dropped by 300,000 and unemployment reached 418,000 in 1958. At the same time, Michigan experienced net out-migration of 322,000 between 1956 and 1962 which was more than what Michigan experienced between 1970 and 1980. But as Michigan recovered from the recession, net migration into Michigan resumed, at least for a while. Since 1968, Michigan has recorded a net loss through migration to other states in every year except 1970. As a result, Michigan gained only 32,000 new residents through migration

Annual Net Migration of Population in Michigan, 1950–1982

during the 1960s despite a strong economy during much of the decade. Population growth of one million people in Michigan between 1960 and 1970, in fact, was almost exclusively due to natural increase (excess of births to deaths). These changes to Michigan's typical pattern of growth through in-migration, however, simply did not become obvious until the 1970s when a net loss of 300,000 through out-migration was recorded.

Out-migration in excess of in-migration, however, is not unique to Michigan. Rather, it is part of a nationwide trend of population shifting from northeastern and north central states to the South and the West. Between 1975 and 1980, the Northeast lost 1.8 million people above the age of five to other parts of the nation; in the north central region, where Michigan is located, 1.5 million were lost to the South and the West. In contrast, the South gained two million people and the West gained 1.2 million during the same five-year period. During this time Michigan lost 256,000 residents to the South and West through migration, with Florida, California, Texas, and Arizona being the major destinations. The high level of migration out of Michigan since 1980, we believe, is also headed in much the same direction. Continuing high rates of out-migration, however, are *not* expected to continue into the future due to several factors, including diminished levels of employment opportunities elsewhere, lower wage scales elsewhere, and high rates of home ownership in Michigan. Nonetheless, continued net out-migration from Michigan during the next several years will still contribute to relatively slow rates of population growth in this state.

BIRTHS AND DEATHS

Another factor contributing to Michigan's slow rate of population growth is the decline in fertility during the past decade. If the fertility rates in the 1970s were the same as in the 1960s, Michigan would have recorded about 2 million births in that 10-year period rather than the 1.4 million births which actually occurred; and population growth in Michigan would have been 11 percent instead of 4.3 percent. Simiarly, had fertility rates remained at their earlier and higher levels, Michigan would have grown by 60,000 between 1980 and 1982 instead of having a 35,000 population loss.

Today, Michigan women are having an average of less than two children each, and this rate of total fertility is expected to continue in the near future. Young women aged eighteen through twenty-four in 1981 reported just over two children as their lifetime birth expectation, virtually unchanged since 1976. Since lower fertility rates have been recorded among employed women and since the number and proportion of childless married women are both increasing, births in Michigan will not increase substantially, even if many of those who have delayed childbearing decide to fulfill their childbearing expectations.

Mortality in Michigan has declined dramatically during the past decade. Life expectancy at birth in Michigan increased from 70.8 years in 1970 to 73.4 years in 1980. This increase of 2.6 years is significantly greater than during the 1960s when life expectancy grew by less than a year. Infant mortality (which is widely recognized as one of the better indicators of a population's general health and welfare) declined from 20.3 deaths per one thousand live births in 1970 to 12.8 deaths per thousand in 1980.[1]

Since 1970 deaths in Michigan have declined fairly regularly. At the present time annual deaths in Michigan are less than eighty thousand. As the health status of the population improves and as advances in medical technology continue, mortality rates in Michigan will continue to decline, and average life expectancy is likely to surpass seventy-five years by the early 1990s. Despite this, the actual number of deaths occurring each year in Michigan is likely to grow slightly during the 1980s as the population ages and as the elderly become a larger proportion of the total.

AGE COMPOSITION

Migration, births, and deaths not only determine population growth but they also affect the age composition of the population. During the fullest development of the automobile industry in Michigan between 1910 and the mid-1950s, large numbers of young workers from Appalachia, the Deep South, and Europe streamed to Michigan in search of work and higher wages. In more recent years, older Michiganians began to leave the state to retire in warmer and sunnier climates. As a result, Michigan's population has been somewhat younger than that of the nation for several decades. Today, Michigan's growing minority popuation—which is substantially younger than the nonminority population and which continues to exhibit higher than average fertility rates—is helping to keep Michigan's population relatively young. Even after a decade of losing young people to the South and the West through out-migration, Michigan's population in 1980 was still more than a year younger than the national average (28.8 versus 30 years).

Despite this younger than average population, Michigan is following the nationwide trend toward growing older. The aging of Michigan's population, however, is no simple matter. Rather, it is due to three very significant underlying trends. First is a dramatic reversal from explosive growth in the youth population through the 1950s and 1960s to precipitous decline in that same population during the 1970s and 1980s. Second, the baby-boom generation itself is growing up and growing older. And finally, people are living longer, and Michi-

gan's older population is growing faster than the population at large.

During the baby-boom period of the late 1940s, the 1950s and the early 1960s, Michigan and the nation experienced dramatic increases in the number of children. The population under five years of age in Michigan increased sharply—by 63 percent between 1940 and 1950 and by 38 percent between 1950 and 1960. The school-aged population (ages five through seventeen), which only increased by 11 percent during the 1940s, jumped by 53 percent in the 1950s and continued to increase during the 1960s. In actual numbers Michigan experienced an increase of more than a million in the school-aged population between 1950 and 1970. Teacher shortages and crowded classrooms were typical during this time period as a result.

Since then, nowever, the dramatic reduction in births after 1970 has resulted in a substantial decline in the population below age eighteen. Between 1970 and 1980 Michigan's population under eighteen decreased by 503,000, a 15 percent reduction. Youths as a proportion of Michigan's population consequently have dropped from 36.5 percent in 1970 to less than 30 percent in 1980. An oversupply of teachers and empty classrooms have become a prevailing problem across the state and the nation as a result.

As the baby-boom population is now squarely within its prime child-bearing ages, the number of births in Michigan may be expected to increase throughout the rest of the 1980s. As fertility levels have remained quite low in recent years and as survey data reveal no perceptible change regarding the number of children women currently want or intend to have, the increase will be due entirely to the large growth in the number of women of child-bearing age—many of whom will actually become mothers. Continued out-migration of young adults from Michigan, however, may be expected to dampen the growth in births during the 1980s somewhat. During the 1990s, barring any changes in actual or desired levels of fertility during the next decade, births may again decline somewhat as the current generation of mothers reaches the end of their productive years.

In contrast to recent declines in the younger population, those aged eighteen through forty-four increased by 22 percent between 1970 and 1980. Again, this increase is due largely to the aging of the baby-boom generation. The proportion of the population eighteen to forty-four increased from 35 percent in 1970 to 41 percent in 1980 and 42 percent in 1982. Throughout the 1970s this growth has been characterized by large numbers of people born during the baby boom reaching eighteen and, in many cases, entering the labor market. Since those entering the labor force for the first time today are from the tail end of the baby boom, those in the age range of eighteen to forty-four will decline by the late 1980s and early 1990s. After 1990, as those who are now eighteen to forty-four begin to enter middle age, they will be replaced by those born later, including their children, who comprise smaller cohorts. As the population eighteen to forty-four shrinks, however, there will be a tremendous increase in the middle-aged population, those between the ages of forty-five and sixty-four. This group grew slightly during the 1970s and experienced a small decline between 1980 and 1982. We believe that this age group will continue to decline during the 1980s as it is increasingly composed of the relatively small cohorts born during the depression and the early years of World War II. Later, during the 1990s, this age group will once again grow as the baby-boom generation begins to enter middle age.

As life expectancy increases, Michigan's older population will continue to increase at a rate faster than any other age group. Between 1970 and 1980, Michigan's population aged sixty-five and over increased by 22 percent. The proportion of Michigan's total population which is above age sixty-five also increased from 8.4 percent in 1970 to 9.8 percent in 1980. Older people will likely comprise 13 percent of the state's population by the year 2000 and perhaps as much as 22 percent by 2050.

Regardless of the specific numbers, the aging of Michigan's population will significantly alter the dependency ratio in this state in two ways. First, while the dependent population has been primarily a young population in the past, the dependent population is becoming old even faster than the general population. Secondly, the ratio of the working-age population (those eighteen to sixty-four years of age) to those who are older is declining and will continue to decline during the foreseeable future. In 1980 there were 5.4 people of working age in Michigan to every person age sixty-five or more. By 2000, this ratio may decline to 4.7 or fewer working age people for every elderly person.

GEOGRAPHIC DISTRIBUTION

Although slow population growth in Michigan during the past decade is mainly due to out-migration, these losses have not been uniform across the state. Losses in population through out-migration in recent years have been mostly from metropolitan areas, especially Michigan's larger cities. During the 1970s, Michigan's metropolitan areas (1981 definition) experienced a net loss of 422,300 people through out-migration. Counties which contain central cities lost more than a half million people through migration during during that period. Among Michigan's largest cities, Detroit, Grand Rapids, Flint, Warren, Lansing, Livonia, Dearborn, Westland, Kalamazoo, Saginaw, Pontiac, Bay City, and Muskegon all lost population.

In contrast, metropolitan fringe counties experienced substantial growth between 1970 and 1980. Newly developing suburban centers such as Sterling Heights, Troy, Southfield, and other fringe communities recorded substantial growth during the 1970s. However, the growth of metropolitan fringe areas during the 1970s was far less spectacular than during the 1960s as population deconcentration has moved beyond the suburbs.

While metropolitan areas and major cities were losing population during the 1970s, the nonmetropolitan and rural areas of Michigan were gaining population. The revival of population growth in rural areas was so great that this became the single most significant development

THE MICHIGAN ECONOMY

Bureau of Business Research
School of Business Administration
Wayne State University

FRED P. UNRUH
Acting Dean
School of Business Administration

DAVID I. VERWAY
Director
Bureau of Business Research

DOREEN BRODER
Editor

GAIL GUIP
Secretary

DAVID L. WILLIAMS
Research Associate

ROBERT FISH
PARESH SHAH
Graduate Assistants

REVATHI BALASUBRAMANIAN
Student Assistant

Michigan Economic Indicators

Item	Year previous of latest month	Previous month	Latest month
Manufacturing workers:			
Average weekly hours, Michigan	40.6	42.5	42.0 (July)
Average weekly hours, U.S.	38.9	40.4	40.1 (July)
Average hourly earnings, Michigan ($)	11.35	11.64	11.66 (July)
Average hourly earnings, U.S. ($)	8.55	8.81	8.86 (July)
U.S. motor vehicle production (units)	609,230	885,550	616,242 (July)
Electricity usage (mil. kwh.):			
Michigan	5,389	5,656	5,400 (Apr.)
United States	164,412	173,959	163,865 (Apr.)
Raw steel production:			
Michigan (000 net tons)	597	588	620 (July)
United States (000 net tons)	5,719	6,993	6,921 (July)
Consumer price index (1967 = 100)			
Detroit area	292.2	296.6	298.4 (July)
United States	292.4	298.1	299.3 (July)
U.S. producer price index (1967 = 100)	300.4	302.5	303.2 (July)
Michigan farm prices received index (1977 = 100)	137	134	131 (July)

SOURCE: U.S. Bureau of the Census; U.S. Bureau of Labor Statistics; Michigan Crop Reporting Service; Ward's Automotive Reports; American Iron and Steel Institute; and Energy Information Administration.

Permit Authorized Construction in Selected Counties, First 6 Months 1982 and 1983

(Thousands of Dollars)

County	Residential			Nonresidential			Office		
	1982	1983	Percentage change	1982	1983	Percentage change	1982	1983	Percentage change
Allegan	1,217	2,617	115	20	41	105	0	0	0
Antrim	1,646	3,408	107	110	0	−100	0	0	0
Berrien	2,857	2,662	− 7	1,216	36	− 97	2,108	0	−100
Clinton	2,009	3,239	61	12	0	−100	0	0	0
Emmet	3,103	2,309	− 26	0	0	0	0	0	0
Genesee	7,860	11,326	44	20	920	4,500	2,195	3,180	45
Grand Traverse	4,912	9,180	87	130	32	75	638	664	4
Ingham	8,532	14,280	67	62	340	448	1,987	340	− 83
Jackson	3,945	2,380	− 40	46	0	−100	31	0	−100
Kalamazoo	7,857	9,536	21	1,324	2,794	111	878	735	− 16
Kent	17,405	42,362	143	9,884	4,129	− 58	3,583	1,589	− 56
Livingston	3,656	7,266	99	1,027	0	−100	451	250	− 45
Macomb	18,004	41,178	129	585	3,572	510	2,120	2,247	6
Midland	1,908	7,207	278	0	405	100	0	205	100
Muskegon	2,248	3,712	65	182	200	10	131	373	185
Oakland	24,851	108,569	337	5,164	5,246	2	12,371	52,581	325
Ottawa	7,058	18,224	158	1,056	1,106	5	80	315	294
Saginaw	1,185	2,819	138	60	180	200	347	651	87
St. Clair	2,469	5,786	134	682	91	− 87	145	1,488	926
Washtenaw	7,433	12,673	71	2,095	6,720	221	5,925	9,277	57
Wayne	9,950	48,179	384	155,309	20,201	− 87	7,203	2,673	63
Michigan	207,617	452,525	118	181,047	57,192	− 68	42,753	81,906	92

SOURCE: Bureau of the Census, special release.

of population change during the 1970s. The magnitude of this change becomes evident when growth trends of the 1960s and 1970s are compared. Metropolitan areas which increased by 928,000 persons during the 1960s only gained 146,000 during the 1970s, an 85 percent reduction in the amount of population growth. In contrast, nonmetropolitan areas which increased by 130,000 persons between 1960 and 1970, gained 234,000 new residents between 1970 and 1980, an 80 percent increase in population growth.

The so-called "rural revival," however, has not occurred uniformly throughout Michigan's nonmetropolitan areas, and cities in rural areas have not gained many new residents as the result of it. Instead, surrounding areas—both those adjacent as well as those further away from nonmetropolitan towns and cities—have been the areas where population gains have been the strongest. In fact, small cities and villages in Michigan's rural areas lost about 1 percent of their population between 1970 and 1980. That means many of those small places experienced out-migration during the 1970s. In contrast, rural parts of nonmetropolitan areas recorded a 21 percent gain in population during this period, and this was due to substantial in-migration.

Among Michigan's nonmetropolitan counties, those located in the southern Lower Peninsula—mainly those which are adjacent to metropolitan areas—experienced moderate population growth during the 1970s. Growth in these counties during the 1970s was 38 percent greater than the gain recorded during the 1960s. Net migration into these counties jumped from 8,500 in the 1960s to 50,600 in the 1970s.

Counties located in the northern Lower Peninsula experienced even more rapid growth. Population growth north of a line from Bay City to Muskegon during the 1970s was double the rate of growth during the prior decade. The net migration rate increased from 7.8 percent in the 1960s to 23.4 percent in the 1970s, and net migration accounted for 80 percent of all population growth in this area during the 1970s.

After fifty years of population decline, population growth was once again observed in the Upper Peninsula. Between 1970 and 1980 the UP gained more than 15,000 residents including the net migration of more than 800 people, thus reversing a long-standing trend of out-migration from this region.

Despite these developments, the rural revival in Michigan was disturbed between 1980 and 1982. Nonmetropolitan portions of southern lower Michigan recorded net out-migration in both 1981 and 1982. Northern lower Michigan experienced a substantial reduction of net in-migration in 1981 and virtually no growth through migration in 1982. And the Upper Peninsula again saw an excess of out-migration over in-migration during this period. Undoubtedly, these findings reflect in part the impact that the recession has had on the mobility of the population. Moreover, high interest rates and fewer job opportunities eventually reduced the ability for many people to move. On the other hand, since the rural revival of the 1970s reflected a general tendency of the population to pursue an enhanced quality of life in less populated areas, we anticipate that the rural revival will reemerge as the economy recovers and people can once again afford to move.

Despite the rural revival, it is important to note that the greatest proportion of Michigan's population still lives in our several metropolitan areas--84 percent in 1970, 83 percent in 1980, and 82.5 percent in 1982. Although the proportion residing in metropolitan areas will continue to decrease, it is very unlikely that there will be more people living in rural areas than in urban areas at any time in the foreseeable future. In particular, southern lower Michigan—where all of Michigan's metropolitan areas are located and where more than 90 percent of all Michiganians live—will continue to be the most populous area in the state.

HOUSEHOLD AND FAMILY CHARACTERISTICS

Despite the low rate of population growth in Michigan recently, the number of households increased 20 percent from 2,653,000 in 1970 to 3,195,000 in 1980. This was accompanied by a decline in the number of persons per household, from 3.27 to 2.84 during the ten-year period.

The number of people living alone or with other unrelated persons has increased steadily since World War II. The big increase occurred during the 1970s—a 70 percent increase from 470,300 households in 1970 to 802,700 in 1980. Nonfamily households as a proportion of all households increased from 17.7 percent in 1970 to 25 percent in 1980. This has been the largest increase in history.

Family households, in contrast, are down from 82 percent of all households in 1970 to 75 percent in 1980, even though the number of families in Michigan increased from 2.2 million to 2.4 million during this period. However, family size became smaller, decreasing from 3.7 persons per family in 1970 to 3.3 in 1980. Husband-wife families were down from 72 percent of all households in 1970 to only 61 percent in 1980. Another big change is the drastic increase in one-parent families. Households headed by women with no husband present increased by 70 percent during the 1970s. Children under eighteen in one-parent families also increased substantially. Ten years ago, one in every ten children under eighteen lived in one-parent families; today, one in every five children live in this type of family.

The changing composition of households and families in recent years indicates a great transition in American attitudes toward family, marriage, and living arrangements. These changes are associated with growing divorce rates (from 3.4 divorces per 1,000 Michigan residents in 1970 to 4.4 in 1980), and the growth in nonfamily households in part reflects substantial growth in the elderly population—particularly elderly people living alone. There has also been increased acceptance of people of the opposite sex sharing living quarters.

CHANGING LABOR FORCE

Another significant transition of Michigan's population trends is closely tied to the changing American industrial structure. During the past two decades the relocation of substantial manufacturing industries and busi-

ness from the North to southern and western states and overseas as well as the development and increasing use of automation in production processes has had serious impact on employment in Michigan. After reaching a peak of more than 400,000 automotive employees in Michigan in 1978 (and more than 1 million nationwide), employment in the auto industry declined sharply. Production line workers, laborers, machine operators, and various skilled crafts workers throughout all of Michigan's industries have declined by 92,000, down from 42 percent of the employed labor force in 1970 to only 34 percent in 1980. In contrast, the number of white-collar workers—those employed in managerial, professional, technical, sales, and administrative support (secretarial and clerical) positions—grew by more than 440,000, an increase of 30 percent. White collar workers accounted for 50.5 percent of the labor force in 1980 compared with 44.8 percent in 1970.

Despite structural changes, the 1980 census also revealed that Michigan continues to be a highly industrialized state in which 30 percent of the labor force is engaged in manufacturing. While this percentage is relatively high when compared to many other states, it also represents a significant decline from the 35.9 percent share recorded in 1970. In contrast, employment in wholesale and retail trade and in the service sector has risen. Employment in wholesale and retail trade increased from 19.4 percent in 1970 to 20.1 percent in 1980. Employment in services, including business services, personal services, entertainment, and the professions increased from 24.5 percent of total employment in 1970 to more than 28.4 percent in 1980.

Another important development is the increase in female labor force participation. In 1970, 40 percent of Michigan women aged sixteen and older were in the labor force (compared with 78 percent of men). In 1980, 49 percent of women were in the labor force (compared with 75 percent of men). An increasing number of women with children are also employed. Of 1.3 million women in Michigan with children under the age of eighteen, more than half were employed or were in the job market in 1980. Moreover, more than 40 percent of these women have children beow the age of six. Accompanying these changes are increases in the number of families with two or more wage earners (up 145,000, from 50 percent of all families in 1970 to 52.7 percent in 1980) and a decline in the number of families with only one wage earner (down 77,000, from 40.5 percent in 1980 to 33.9 percent of all families in 1980).

IMPLICATIONS: SLOW POPULATION GROWTH

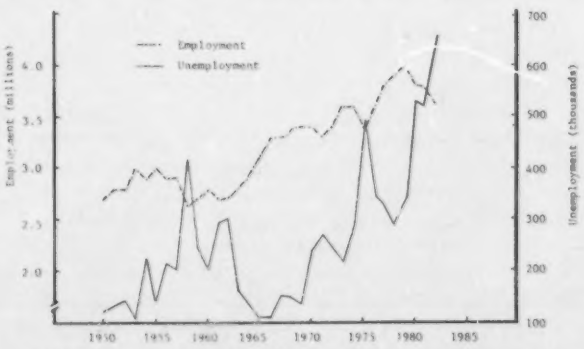
While it is quite clear that population growth in Michigan has slowed in recent years, the population losses suffered between 1980 and 1982 are not expected to continue as the nation recovers from the recession. As Michigan's recent population trends reflect a general population shift from northern states to the South and the West, relatively slow population growth may be expected in the future. Perhaps the most significant result of this will be losses in political influence. Michigan lost one congressional seat following the last census due to relatively sluggish growth compared to other states, and continued slow growth will almost certainly result in additional losses of congressional representation following the 1990 and 2000 censuses. In addition, as long as population is used as a factor in allocating funds to states and local units of government through revenue sharing and other formula grant programs, Michigan's share will continue to decline as the focus of growth moves elsewhere and Michigan slowly becomes a relatively smaller portion of the nation.

Slowing population growth may also be viewed as an opportunity for Michigan to enhance the quality of life and adequacy of services to the pubic because of diminishing demands and pressures from the population. However, the changing household and family composition of Michigan's population, as mentioned earlier, will undoubtedly create new demands for services of various sorts. Moreover, the aging of the population will result in a shifting of demands from one segment of the population to another. These shifts will also create new markets which will require new products and services—or at least a new mix of products and services—all of which will stimulate the economy in Michigan.

IMPLICATIONS: EMPLOYMENT AND OUT-MIGRATION

In recent years, a large number of manufacturing industries originally located in the North have established or expanded their physical plants in the South or the West. As a result, manufacturing activities have grown at a considerably accelerated pace in these regions. Such differential growth along with increased automation throughout Michigan's industrial infrastructure point to continued diminishing industrial employment opportunities in Michigan.

Employment and Unemployment in Michigan, 1950–1982



These trends are not inevitable, however, despite the population and economic patterns of the past decade. Efforts to capitalize on Michigan's industrial strength are just beginning at this time. Reindustrialization through physical plant modernization, expansion of the products manufactured by Michigan's metal-forming industries, expansion of the paper and pulp industries and other agricultural processing activities, and establishment of the just-in-time production system for the automotive industry (such as the Buick City project in Flint) may serve to diminish the outflow from the state. The extent to

BEST AVAILABLE COPY

which these approaches are implemented and the extent of their impact, however, remain to be seen.

IMPLICATIONS: CHANGING AGE COMPOSITION

Low fertility rates, reduced rates of marriage, and delayed marriage and childbearing among those choosing to marry have all contributed to relatively low birth rates in Michigan in recent years. As these practices and trends are expected to continue, we anticipate low levels of fertility—with births numbering between 135,000 and 150,000 per year—for the rest of this century.

These trends have resulted in substantial drops in the number of children in Michigan and consequent declines in school enrollments. Total public and private school enrollments dropped from 2.46 million during the 1969–70 school year to 1.87 million in 1981–82, a decrease of 24 percent. To maintain original levels of faculty, staff, and services in the schools in face of declining enrollments will inevitably entail per student cost increases. Ancillary problems concerning the best uses of existing facilities and staff to serve the educational needs of the adult population are also emerging as a result of declining enrollments among children.

In contrast, both the number and the proportion of Michigan's population aged eighteen to forty-four are increasing despite tremendous out-migration in this age group to other states. The immediate impact is an increase in the childbearing age population and the maintenance of moderate levels of births despite sharp declines in fertility rates during the past decade.

This age group has exerted strong pressures on Michigan's colleges and universities in the past. Enrollments in institutions of higher education in Michigan increased without interruption until 1980–81 when enrollments reached a peak of 554,000. Since then, enrollments have begun to decrease as the tailend of the baby boom generation finishes college. This decrease in enrollments will probably continue for at least ten more years.

The most serious impact of the increase of younger adults in recent years has been the dramatic increase of new entrants to the labor force. Those currently aged eighteen to forty-four comprise a large potential labor pool, much of which is the product of the baby boom. As these unusually large birth cohorts have reached the age of employment, they have tended to experience unusually high rates of unemployment. This we believe has been due to the inability of Michigan's economy to expand quickly enough to absorb the increased labor supply. This phenomenon alone explains roughly half of the out-migration of those aged fifteen through twenty-nine during the 1970s and perhaps even more during the recent recession.

As the baby boom generation matures during the next two decades, it will be replaced by smaller cohorts born during more recent years. Because of this projected decline of new entrants to the labor force combined with the changing demands for goods and services generated by a maturing population, it is possible that we may actually experience labor shortages — probably in such areas as personal services as well as various technical business and repair services—as early as the mid-1990s.

For the older population (sixty-five and older), both numbers and proportions have been steadily increasing during the past decade, and they will continue to do so during the next several decades. By the year 2000—as the baby boom generation approaches retirement age—we anticipate a "senior boom." By then, one of every three or four adult Michiganians will be sixty-five or older. Many older people in Michigan, in fact, will live to be more than 80 years old. In other words, many older people will have another fifteen or twenty years to live after retiring at age sixty-five.

The immediate impact of this increase is a shift in Michigan's dependent population from young to old. The cost of social services for the aged will continue to increase and will place a growing financial burden on the working-age population. The current financial crisis within the Social Security system is a prime example of the sort of problems the states and smaller areas will have to face during the next decade or two.

In addition, the needs of older people are different from those of the young. As the older population continues to increase, the elderly will create new demands on the economy, on government, and on our various institutions and social systems. The key long-term impact of Michigan's changing age composition will be seen in the institutional adjustments made to better serve a growing older population: increased political influence among the elderly; growing recognition of the elderly market for goods and services of all sorts; and, most importantly, increasing concern with the productive utilization of the elderly population throughout the economy.

IMPLICATIONS: POPULATION GROWTH IN RURAL AREAS

Rural areas in Michigan experienced substantial population growth during the 1970s. As a result, many rural cities and towns—communities which had become used to little or no growth or even declines in population—were now faced with redirecting their attention to the problems associated with population growth. These problems have mainly revolved around providing adequate public services such as fire and police protection, water and sewage, solid waste disposal, road maintenance, and snow removal. Furthermore, as much of the rural residential growth and industrial development has taken place adjacent to or even further away from Michigan's nonmetropolitan cities and towns, there is the danger that the problems which accompany such development may overwhelm the limited planning and governmental resources available in Michigan's more rural areas. The rural environment which first attracted new growth and development in the 1970s might be ruined in the 1980s unless adequate environmental safeguards are devised and maintained during the next several years.

Although the growth in rural areas was interrupted in the past two years, we believe that the movement from urban to rural areas will continue as the economy recovers and people can again afford to move. Problems

THE MICHIGAN ECONOMY
Bureau of Business Research
School of Business Administration
Wayne State University
Detroit, Michigan 48202

Address Correction Requested

NON-PROFIT ORG.
U. S. POSTAGE
PAID
Detroit, Mich.
Permit No. 3844

CHERYL WALDMAN
CONG INFO SERV
4520 EAST WEST HWY
BETHESDA MD
20814

associated with rural growth in the recent past will be magnified as this pattern of rural population growth is reestablished during the 1980s.

SUMMARY

Michigan is in the process of a great transition. While the economy is becoming more diversified, the demographic character of this state is also changing. As manufacturing and other economic activities shifted from the North to the West and the South during the past several decades, Michigan experienced heightened levels of outmigration which only became evident to most people during the late 1970s and the early 1980s. Moreover, because of decreased demand for industrial workers in manufacturing jobs—jobs which constitute one-third of Michigan's work force—Michigan will continue to lose population through migration until the transition is completed at the level that a more diversified economy can absorb and attract new workers.

Along with this transition in the economy, the aging of the population as well as changing attitudes towards the family, marriage, and living arrangements have affected Michigan's demographic trends in recent years. Fertility has been at near record low levels for some time, and people tend to want fewer children and to delay child bearing. As a consequence, household and family size decreased substantially in the past decade. At the same time, people are living longer, The number and proportion of older people has been increasing substantially while the number of younger people has decreased dramatically in Michigan. As a result, a short supply in the labor force will be felt during the next two decades in contrast to the oversupply of labor we have had to cope with in recent years.

Finally, the rural revival has been felt strongly in Michigan, and despite a severe slowdown in the urban to rural movement brought on by the poor economy in recent years, the natural beauty, the recreational opportunities, and other amenities in Michigan will once again draw new residents, new businesses, and new industries during the next decade. Along with this growth will come the problems of population and economic growth which were thought to have been left behind.

NOTE

1. The provisional infant mortality rate for the entire United States was 12.5 deaths per 1,000 live births in 1980; the provisional infant mortality rate for Detroit was 21.0 in 1980, according to figures provided by the Office of Vital and Health Statisics, Michigan Deparment of Health.

REFERENCES

Rosen, Laurence S. "The Future of Michigan's Population." Address delivered at the annual conference of the Michigan Sociological Association, 6 November 1982, Aquinas College, Grand Rapids, Michigan.

Rosen, Laurence S. and Wang, Ching-li. "Michigan." *American Demographics* 5, no. 3 (March 1983): 46–48.

U.S. Bureau of the Census. "Fertility of American Women: June 1976." *Current Population Reports*, no. 308 (June 1977): 20.

_____. "Fertility of American Women: June, 1981." *Current Population Reports*, no. 378 (April 1983): 20.

Verway, David I. "Michigan Outlook." *The Michigan Economy* 1, no. 1 (June 1982).

Wang, Ching-li and Rosen, Laurence S. "Preliminary Population Counts: 1980." *Michigan State Economic Record* 23, no. 1 (January 1981): 3–8.

Wang, Ching-li. "Population Change in Michigan Counties: 1980–82." Report for Michigan Department of Management and Budget, March 1983.

_____. "Where Michigan's Population Moved: 1975–1980." *Michigan Economic Review and Outlook* (April–June 1983): 9–14.